

A TREATISE
ON
FIRST DENTITION,
AND THE
FREQUENTLY SERIOUS DISORDERS
WHICH DEPEND UPON IT.

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A WORK CROWNED BY THE ROYAL SOCIETY OF MEDICINE, OF PARIS,

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TRANSLATED FROM THE FRENCH,

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TRANSLATOR'S PREFACE.

The art of Dentistry, long neglected and much abused, is at length beginning to receive the attention it deserves. Able and zealous men are devoting themselves to the study of Dental Pathology, and to the formation of rational and scientific rules of practice in this department of medicine; and a combined and powerful effort is about to be made, to elevate the pursuit of dentistry to the importance and dignity of a distinct and honorable profession.

One of the greatest hindrances to the attainment of this very desirable end, is found to be the scarcity of good books upon dental medicine. Of the many that have been written upon this subject, few are worth perusal; and the greater number of those that are valuable, are only to be found in languages with which many who would gladly read them are unacquainted.

It is evident that no progress can be made in the advancement of the dental art, until this want of elementary books shall have been supplied; therefore there is no way in which the good of the profession can be so immediately and certainly promoted, as by throwing open to the many the information hitherto locked up in foreign languages, and only accessible to the few.

It is with this design I have undertaken the translation of the present work. It is one that should be in the hands of every physician, and more particularly of every dentist. No other commendation of it is necessary, than to call attention to the fact, that it is a prize essay—crowned by the Paris Royal Society of Medicine.

It is due to myself to say something with regard to the manner in which the translation has been performed.

The reader need not expect to find literary excellence in the following pages. My object has not been to improve the style of Baumes, but to translate his work. Occupied as I am by the cares of my profession, I could not accomplish *this* without much sacrifice and self-denial. A physician engaged in practice, has but little leisure, and that little he values highly.

I make no apology for the haste in which the translation has been executed. Under the circumstances, it must have been done hastily or not at all. As it is submitted to the public almost without revision, it is to be expected that many errors will be found in it; but I trust that some leniency of criticism will be shown for one, who has laboured cheerfully, if not successfully, for the benefit of a profession to which he does not belong, without expectation of other reward, than that which springs from a sense of usefulness.

THOMAS E. BOND, JR.

Baltimore, April 3d, 1841.

A TREATISE
ON
FIRST DENTITION,
AND THE
DISORDERS WHICH DEPEND UPON THAT
DEVELOPEMENT.

1. The life of man is distinguished by certain periods, during which, the body acquires a new degree of perfection by the development of its organs, and of the functions which belong to them. These periods are characterized by certain phenomena which depend upon the nature of the developing organ, and the excellence of the functions that pertain to it. When regular, they result in real increase and perfection: when irregular, they become the cause of suffering and even of death. When regular, they shew that nature exercises free command over the body she has formed, for upon this they depend: when irregular, they manifest errors of this same nature counteracted by our constitution and by other physical causes under the influence of which we live.

2. The acquisition of the Teeth is the first of these developments. It takes place at a time when the body is excessively excitable; when pain produces severe effects, and when the irritation consequent upon the local development, largely influences the rest of the system. Dentition, therefore, is a very important epoch in the history of man, and it is extremely useful to examine it in all its different aspects. In it may often be found the cause of the death of a great number of infants, and the foundation of certain serious disorders which are subsequently developed, or which remain for life as taints in the constitution.

Before proceeding to the details necessary to prove what I have just advanced, it is necessary to premise something concerning the teeth—their nature—their number and the laws that govern their eruption.

Summary Exposition of the Anatomy and Physiology of the Human Teeth.

3. The French call 'dent' (and the English *tooth*) that which the Greeks have named 'odous,' and the Latins 'dens.' It has been said that this latter word 'dens' is but an abbreviation of the participle 'edens,' eating; but this etymology is not at all satisfactory, and indeed it is of little consequence to know the true root of the word. It is almost useless to define the teeth. They are little bones, variously shaped, according to the use they are to subserve, composed of a body terminated by a depression known as the neck, and of one or more roots. These bones, of a peculiar structure, commence to protrude from the jaw bones some time after birth, to serve as ornaments of the mouth—to assist in articulation, and more especially to perform the function of mastication, which is the first act of digestion,—consisting in the chewing of the food which by this process becomes thoroughly mixed with the saliva.

4. The teeth, compared with other bones, differ from them in that they offer to the sight a white, hard, compact substance which renders them stronger, less liable to alteration and more beautiful. This white substance is called *enamel*. This covers the bony structure, which, rising above the neck, constitutes the *crown*, or that which, standing out from the alveolar process and the gum, forms the visible part of the tooth. It is known that bone cannot be long exposed to the air without becoming black and decaying. In order to prevent this in the case of the teeth, it is necessary that the bony matter which composes them, be protected by a substance, incorruptible by the air and the various substances which pass through the mouth. Therefore the enamel is not spread over the internal and concealed parts of the teeth, but is made to sheathe and protect that portion which is external and exposed. It is thickest in the places where we observe the eminences upon the teeth; these little eminences being entirely formed by this substance.

5. So far as concerns the bony structure of the teeth, these little bones are composed of phosphate of lime mixed with gelatino-albu-

minous substances. The phosphate of lime has been well known for a long time ; and that which for ages had been supposed to be a peculiar earth, has been at length discovered to be a saline substance, obeying the general laws of combination and crystallization.

6. Although it is easy to perceive that the enamel is something different from the bone, it is not so easy to discover its nature. M. Josse de Rennes has thrown some light upon this matter in a paper containing the result of his physical and chemical examinations of the teeth, published in the Journal of Medicine, Autumn number, year 10.

7. According to M. Josse, the enamel is white, smooth, polished, transparent, very brittle and extremely hard. In its fracture it presents a well marked and regular crystallization, made up of an assemblage of little shining crystals, very closely compacted and needle-shaped. In all the surfaces which it covers, it appears to be disposed in radii, a little oblique and horizontal, almost perpendicular to the body of the bone ; forming at the point of contact with it, two angles, one superior acute, the other inferior and obtuse.

8. As to the peculiar nature of enamel, M. Josse was on the point of concluding that this substance is an oxalate of lime, and at that time he thought he discovered some correspondence between it and the oxalato-calcareous zoölythes, or urinary calculi, formed of oxalate of lime, a sort of calculi that are frequently and perhaps exclusively met with in children. Abandoning this idea, which did not appear well founded, M. Josse finally concluded that the enamel is a pure phosphate of lime, regularly crystallized, consequently without parenchyma, but susceptible of decomposition and of that kind of alteration which we observe it to undergo. If M. Josse had so directed his researches as to observe the action of phosphoric acid on lime, it is possible that he would have discovered that the enamel does not differ from the body except in this, that the latter is a calcareous *phosphate*, and the former a phosphite or a phosphuret of lime.

9. It has been generally believed that the roots of the teeth, and even their cavities, have on their surfaces a greater or less quantity of enamel. Some have gone so far as to advance the opinion that the enamel is as necessary upon the internal as upon the external part of the teeth,—the external to limit their growth, and on the internal to maintain the diameter of the canal nearly in the same state. But these opinions are not at all well founded ; and the latter is

altogether unjustifiable. Bichat* appears to me to have victoriously refuted them. According to him, the enamel is only found upon the crown. Many anatomists think that it extends also a little way over the root, misled doubtless by the extreme whiteness of the roots of some teeth, which renders it impossible to detect any line of demarcation. But a very simple experiment demonstrates the incorrectness of this opinion. This consists in macerating the tooth in nitric acid, diluted with water. The acid attacks immediately both the root and the crown, but the one becomes yellow, as almost all animal substances do when acted upon by this acid, while the other preserves its color, becoming indeed more white than before. This experiment proves also, that their respective composition differs essentially. This difference, however, is not unlimited, for acids whiten the teeth only in corroding them, and although the enamel is not at all influenced by the air, it is accessible by many substances that cause it to lose its color and even destroy it altogether.

10. Thus the teeth are formed by two substances; the one analogous to the bones; the structure of which is condensed, much like that which constitutes the petreus portion of the temporal bone, and the other harder and more compact still, which is called enamel. The whole forms a bone which has a cavity, greater in youth and very small in advanced age. In this cavity is lodged the soft part of the tooth, which appears to be nothing more than a flexus of vessels and nerves peculiar to each tooth, and tied together with cellular tissue. This soft substance is as exquisitely sensitive as the medullary pulp; so that the teeth are susceptible of violent pain and are capable of involving the whole system in a community of suffering, and of producing more or less serious lesions through extensive sympathy.

11. We have seen that the enamel only covers the body, otherwise called the crown of the tooth. This is the visible part, and forms nearly the half of the tooth. The other half is concealed, partly by the gum which is attached circularly at the bottom of the crown to the place known as the neck of the tooth, and partly in the cavity, formed in the dental border of each maxillary bone. The species of articulation which fixes the root of the tooth in this cavity, is known by anatomists as 'gomphosis.' The root is simple or bifurcated—double or triple, according to the tooth in question. The adherence of the gum to the neck forms a circular pad, from which,

* General Anatomy.

many membranous bands are sent off to insinuate themselves into the dental substance. Thus nature has multiplied means to fix the teeth in their sockets and to enable them to perform their functions.

12. The first teeth, which pierce the gum in infancy, are not permanent. They fall out about the age of seven years, and are known as the milk teeth, or the deciduous teeth. The second set which take the place of these are the permanent, or the adult teeth. These differ in number and in size. The milk teeth are smaller and almost always twenty in number when the first dentition is completed. Each jaw is furnished with ten of them. The permanent teeth are never less than twenty-eight, nor more than thirty-two. Many persons have only thirty, including the *dentes sapientiæ*, or wisdom teeth. Authors have recorded occasional cases of irregularity in the number of these teeth. The anatomist, Columbus, states that one of his children had three rows of teeth. Valerius Maximus and Pliny had noticed cases of the same kind. History records that one of the sons of Mithridates had two ranges of them, and Hercules was said to have had three. Arnold, a physician of Breslaw, stated that he met with a child of fourteen years of age that had seventy-two teeth, thirty-six in each jaw. They were sound and regularly arranged in two rows, except the incisors, which were slightly displaced. I, myself, have seen two children having each a double set of teeth, but they were in bad health, and the phenomenon was complicated with a scorbutic condition of the gums, and great general debility. I have recorded one of these cases in the old Journal of Medicine. They differed essentially from those described by Professor Sabatier. He has noticed that in some persons in whom the maxillary bone was very short, some teeth were crowded into the rear of the dental arch and there appeared like a double set, though in fact the number was no greater than usual. Rusych has also mentioned adults in whom he has observed supernumerary teeth. Such cases however are but feeble exceptions to the general laws upon which is founded the history of dentition or odontography.

13. Man is provided with three kinds of teeth, which have received different names according to their forms and their use. Some are called incisors or cunei-form, others canine, or conoid, or angular—others molar and cuspidated, divided into bicuspid and multicuspid. Each jaw has four incisors which occupy the centre; two canine placed immediately after the last, one on each side, and eight or ten molars

ranged after the canines. Of these there are four or five on each side ; and when the individual has but thirty teeth the superior jaw has only eight molars, while the inferior has ten. This only relates to the permanent teeth.

14. As to the milk teeth there are but twenty of them as we have before said ; of this number there are eight incisors, four canines, and the first eight molars equally divided between the jaws. All these teeth are distinct from one another ; nevertheless there have been some very rare exceptions to this rule. Plutarch and Valerius Maximus relate that Pyrrhus, king of Epirus, and one of the sons of Prusias, king of Bythynia, had only a single bone in each jaw which took the place of the teeth. Bernard Jengha reports that he found in a heap of bones preserved in the hospital Saint Esprit, in Rome, a skull with an inferior maxillary bone, to which there were but three dental bodies, one which had the place of the four incisors, and two canines, and two others which seemed to represent the five molar teeth on each side.

15. In these cases, were the teeth really united, or were they not only seemingly so through a complete incrustation of tartar, as has been verified by other observers ? Eustachias has observed in an aged person three or four molar teeth, united by a hard and almost flinty substance. M. Sabatier, has seen a young girl fifteen or sixteen years old, who was scorbutic, all of whose teeth were encased in a flinty crust which united them and separated them from the gums. A dentist took away this tartar, and all the teeth became distinct and separate.

16. The incisor teeth of infancy differ little from those of adult age. The denomination, incisors, is derived from their function which is to *incise*, or cut—some have called them cunei-form because their roots have the form of a wedge. These teeth are convex externally, and concave internally, somewhat triangular in form—very thick about the neck, thin and sharp along their edge, which is semi-spherical, thick in their roots, which, almost always single and finishing in an obtuse point, are conical, flattened on the sides and are somewhat longer than their body. The two middle or anterior incisors of each jaw, are thicker and larger than the lateral incisors that are next to them ; and generally the teeth of the upper jaw, especially the anterior teeth, are larger than those of the inferior. This excess in size makes it necessary that the incisor teeth of the superior jaw should describe an arc of a greater circle than the teeth of the lower jaw.

This has been remarked by Bertin. This arrangement gives greater facility in cutting the food, as the teeth are made to move upon each other like the blades of scissors ; besides it rounds the face more elegantly, and prevents the chin from projecting disagreeably, which would be the case if the lower jaw were larger. Besides as the upper jaw is immovable, it is necessary that the lower should be thrown within it, in order to augment its power, and to occasion the least fatigue to the muscles which move it.

17. The *canine* teeth, so called from their resemblance to those of the dog, are also termed *angular*, because they are situated opposite to the angle of the lips, and *conoid*, because of their shape. The canine teeth of the upper jaw have also been called eye teeth, either because they are situated beneath the eyes, or from the supposition that they are connected with the orbit. The canine teeth are thicker than the incisors: they are but slightly concave on their internal face, and their superior extremity is pointed. Their roots which are commonly divided into two branches, are thicker and longer than those of the incisors, and indeed are longer than they, in proportion to their bodies. It is thought that the canine teeth have a stronger tendency to increase in length than the other teeth. When this vice exists, unless it be counteracted by the file, it interferes with mastication, and embraces the whole economy of the dental system.

18. The term molar as applied to the teeth is derived from their property of grinding—depending upon the size of their surfaces—much after the manner of millstones. The term cuspid announces that they are provided with little eminences or points, and those of bicuspids and multicuspid indicate that they have two or more points. Bertin says, that the molar teeth may be considered as consisting of several canine teeth united together, and their form does not contradict this idea. The molar teeth of infancy, are eight in number as I have already said. Each jaw has four of them, two on each side. They come immediately after the canines, are larger than the adult teeth which correspond to them, and present a variety in the surface of the crown. These molars have a surface relative to their size. They are shaped like a long square, rounded at the angles, and are composed of a body more especially called the crown, and of a root which is longer than those of the preceding teeth. This root is ordinarily divided into two or three branches, which separate more or less from one another, are longer than their body, and hang themselves

in the little cells hollowed out in the common alveolars, which is not that of the permanent teeth. The roots of the permanent are longer than those of the temporary molars. The surface of the crown of the molars of the inferior jaw, bears ordinarily five eminences placed along the borders: three on the exterior and two on the interior side. The molars of the superior jaw have on the contrary only four eminences: one on the internal, and three on the external side; and of these three, the middle one is the longest. The middle of the surface of the tooth is hollowed out.

19. The alveoli which receive the roots of all these teeth are distinct from one another, separated by a bony partition and lined interiorly by a membrane interposed between the alveolar wall and the tooth. It is in these cavities that, long before the completion and eruption of the teeth, their gums may be found; for the jaws of the fœtus are closed all along their free borders; but in the interior there exists a range of little membranous follicles which are separated by minute partitions, and which before the formation of the teeth have the arrangement that these shall ultimately present.

20. These little follicles have for their envelop a serous membrane, and they contain a pulp situated at the extremity of the vessels and nerves that penetrate them. The membrane that serves to envelop the follicle, forms a shut sack without opening, which first lines the walls of the alveolus to which it adheres by filaments. When it reaches the place where the nerves and vessels penetrate, the membrane leaves the alveolus and is doubled or reflected over the vessels and nerves, accompanies them in their course and finally expands itself over the pulp of the tooth in which they terminate. Thus the membrane has two parts; the one adhering to and lining the alveolus, the other free and covering over the pulp; just as the pleura has two parts, the one adhering to the ribs, the other covering the lungs. The whole consisting of one piece which is doubled to perform the distinct office. The pulp and the vessels, although invested in the duplicature of the membrane are not contained in its cavity. The interior of the sack contains nothing but the secretion which lubricates it, and every thing indicates that this secretion is albuminous.

21. Such are the gums of the teeth. It is not easy to discover at what time these membranous follicles are formed; but it appears that their ossification dates its commencement from the fourth or

fifth month. It is on the pulpy portion of the membrane of the follicle, and at its floating extremity, that the first point of ossification appears. It soon spreads, and takes the precise form of the summit of the crown of the tooth, which it subsequently forms. Developed first from the side next the gums, it stretches afterwards from the side of the vasculo-nervous pedicle and moulds itself upon this in its course towards the point where the vessels enter the alveolus. Next to this the crown is the first-formed; and at the time of birth, we find the twenty teeth of the first dentition already far advanced.—All the crown of them is formed, and the commencement of the root presents itself under the shape of a large quill, with extremely thin walls which goes on lengthening and thickening, until it reaches the bottom of the alveolus, when the tooth becomes too large for the cavity and breaks forth.

22. The mechanism of the structure, and of the birth of the teeth, may be readily understood after these details. The pulp of the tooth is the first part formed, and is at first the most considerable portion of the structure. It appears that the bony part forms next, and then the enamel forms upon the outside of this. As ossification advances, that part of the follicular membrane which lines the alveolus remains fixed and adherent, while the portion corresponding to the pulp at first free from the other side, becomes on its side adherent to all the dental cavity which it lines, and of which it forms the proper membrane intermediate between the pulp and the bony substance. As the jaw bone is developed, and the ossification of the tooth progresses towards the root, the tooth can no longer be retained in the alveolus, the cavity of which is at the same time straitening and filling up.—Hence the tooth must be pushed forward, piercing the alveolar membrane, the pulpy tissue of the gum, and the mucous membrane of the mouth, which covers it. This effect is produced by the gradual pressure, aided undoubtedly by the structure of the gum which gives way in the progress of the eruption.

The two membranes, the alveolar and the mucous membrane of the mouth, being gradually worn away and pierced, but having been contiguous, their borders unite and adhering together to the neck of the tooth they constitute the circular pad which we have remarked to exist upon this part of the tooth. It ensures the stability of the organ.

The formation of the root in first dentition, is rarely so perfect as

in the second. The internal cavity also remains very large, and the pulp is more considerable.

23. It is very rarely that the teeth pierce the gum before birth. There are nevertheless some examples of this. Columbus, Van Sweiten, Marcellus Donatus, after Anteginus and Pliny, have cited cases of the kind. Louis the Great was born with two teeth. Haller mentions nineteen children who were the subjects of the same phenomena. We read in the Gazette of Health, year 1780, page 145, that on the 13th of August, Madame de la Neuville was happily delivered of a fine daughter, having two incisor teeth in the upper jaw, and three days afterwards these were followed by two others on each side of these, making six in all ; but this infant died in convulsions occasioned by this precocious eruption. Polydorus Virgilius reports the case of a child born with six teeth. We might find similar examples, nevertheless they are rare ; and it remains essentially true that the first dentition is begun in the alveoli during the continuance of the fœtus in utero, and is not manifested by eruption until after birth.

24. The eruption of the deciduous teeth is gradual ; and ordinarily they appear two by two at intervals more or less distant. This eruption which commences generally at the age of 7 or 8 months, is not ordinarily completed until the thirtieth month. In many, however, dentition is terminated within two years. The two smaller incisors of the inferior jaw make their appearance first. Fifteen days or three weeks afterwards, the corresponding teeth are cut in the upper jaw, and successively the two lateral incisors below pierce the gum together, and are followed by the two in the upper jaw. After these, succeed the two canines of the lower jaw—then the two of the upper jaw—then the first two molars below, one on each side, pierce the gum together, followed by their corresponding teeth above, and then the first dentition is completed by the eruption of the two other molars below, followed by two above.

25. We may say that generally the incisor teeth are cut first, and in the order we have described. Nevertheless, in cases where the dentition has not been difficult, it has been observed, very rarely it is true, that the lateral incisors have appeared first. A physician of my acquaintance knew a solitary case where the canines made their appearance before the incisors. Raw relates one of the same kind. It happens often with regard to the canines, that they are not cut until

after the first four molars, and sometimes not until the eruption of all the molar teeth. In some cases the teeth of the superior jaw have appeared before those of the inferior. Cases have been met with, very rarely however, in which the eruption of the teeth has been very tardy. Van Swieten ⁽¹⁾ knew a case of a vigorous girl whose first tooth was not cut until the nineteenth month. Charles Rayger ⁽²⁾ has mentioned another where the four canines did not make their appearance for the first time until the thirteenth year, after eight days of pain in the head and eyes, and epileptic convulsions. Fauchard ⁽³⁾ has left an account of a child five or six years old, in whom the greater part of the teeth had never appeared, and who had none except some in the anterior of the mouth. Brouget ⁽⁴⁾ speaks of a child twelve years of age which had but the half of its proper number of teeth, and whose alveolar border had acquired the hardness of the gums of aged persons. I knew at Saint Gilles a bailiff named Vaizen, who never had a tooth. Pherecrates, according to Valla, never had any teeth.

26. First dentition has two periods. The first is that in which the ossification of the teeth is going on internally. We have seen how this is effected. Then the tooth presses forward; the gums swell; the salivary secretion is increased, and the tooth pierces the tissues which cover it. This is the second period of the eruption of the teeth. This double phenomenon is proved by the accidents which happen sometimes three or five months before the teeth make their appearance externally. There are, indeed, certain cases in which the children do not suffer at all except during the ossification of the teeth; the accidents of dentition ceasing with them as soon as the second period arrives.

27. I have said that the twenty-seven teeth which create the first dentition, have generally appeared at the end of the second year of life. The molars, which complete it, appear the last and are necessary to grind the aliments. Nature has established this law. What inference should we draw from it? This certainly, that nature in taking about two years to complete the deciduous dentition, seems to have determined the period during which the infant should be nourished at the breast. Is it not a violation of nature to wean the child

1. Comment. tome iv. s. 1374.

2. Collect. Academie, part, etrang. tom. 1, page 401.

3. Le Chirurgien Dentiste, tom. 1.

4. Educat. Med. des enfans, tome 1.

before it has been provided with the implements of mastication? How can a sick or languid child whose gums are inflamed or irritated and painful, incise and chew its food? The milk of the nurse is under these circumstances both the food and the remedy, and to deprive these tender ones of both the one and the other is a cruelty which may result in the most painful consequences. Observers have but one opinion upon this point. Levret who confined his attention to midwifery and the diseases of young children, saw such deplorable effects of premature weaning, that he recorded his protest against it in his writings. He says, when an infant recently weaned falls sick in dentition, its mouth becomes very hot; it refuses food; it can only drink; serious diarrhœa attacks it, and if this continues long, marasmus results. In this condition we do not know what to do for it or what to give it with probability of success, and many such perish. If the breast had been left them, it would have been their comfort and the support of nature. Indeed we see children under these circumstances seize the breast with avidity, suck some mouthfulls and return often to that which while it nourishes them refreshes the mouth, softens the gums, and facilitates the eruption of the teeth. Honey, the brains of hares, the marrow of deer, and the grease of bears &c., all these are poor and unavailing substitutes for mother's milk.

28. This work is intended to expose cruelties equally great. Writers on medicine have devoted but little time to these things, and their observations are scattered through volumes on midwifery and diseases of women and children. It is time that their observations should be collected into a body of doctrine. The order I have taken to accomplish this, consists in giving a solution to the question proposed by the Royal Society of Medicine of Paris, in these terms. *What are the means of preserving nursing infants from the accidents of dentition, and of remedying these disorders when they are incurred?*"

My work naturally divides itself into two parts. In the first place to discuss the causes which creating disorder in the dental system, injure its mechanism and embarrass dentition; that is to say, to inquire into the causes which can derange dentition, and note the means of preserving nursing children from the accidents to which they are exposed at the period. In the second place I will endeavour to describe the evils which depend upon dentition, and to point out the remedies proper for them.

PART FIRST.

Of the causes which may derange dentition, or of the means of preserving nursing children from the accidents to which dentition exposes them.

29. There can be no doubt that dentition of itself, is not necessarily attended with serious or painful phenomena. Nature could not attach to the development of our parts, real danger to life, or such suffering as must directly threaten it. Nevertheless, all experience teaches that dentition is to be dreaded. It is said that the one-sixth of children perish from the accidents of dentition, and it is often difficult, and sometimes impossible to prevent these disorders. It is therefore natural that practitioners should seek to discern what are the causes which can derange dentition, and render it painful or fatal.

30. Opinions have varied upon this important subject. Some have seen nothing to cause these accidents but the degree of sensibility, which nature has imparted to young children; such have not considered that the gums are not very nervous organs, that the nerves do not play an important part in dentition, and that there are in the economy of infancy, many acts which, much more than the development or formation of the teeth, might occasion these serious accidents which are apt to occur at this period. It is true that morbid sensibility may contribute greatly to the suffering which infants experience in dentition, but to look no farther than this, would be to examine but a small part of the causes that render this period dangerous.

31. Others have looked no farther than to the fact of the pressure made by the roots of the teeth upon the alveolar periosteum. These have not considered that the shooting of the teeth, characterized by the enlargement of the alveolar walls, the distention of the gums, occasioned by the formation of the body or of the crown of the

teeth, &c. is an epoch often more dangerous than that of the organization of the roots, which besides would do much more harm in compressing and binding the soft and pulpy part of the tooth, than the serous membrane which performs the function of a periosteum, and lines the interior of the gum and the proper cavity of the teeth.

32. Others again have confined their attention altogether to the strong resistance of the gum to the passage of the teeth. The molars particularly from their breadth of surface, have appeared to augment the effect of this resistance, and to increase the evil of it, and in the process of dentition the membranous tissue which the tooth must pierce or destroy, is very little raised up, before it is ruptured, while in polypus and other tumours, which take their origin sometimes under the membrane of the gums, it is very much more distended, and indeed in such cases it does not give way at all but only is raised up as Bichat* has justly remarked.

We know the opinion of Herissant, and Janke, and Armstrong, about the gum, which the first of these observers has called *temporary* to distinguish it from that which is permanent, and upon the little importance that we should attach to the destruction of that gum; and although on the other hand we are met by the opinions of those who have dwelt upon the sensibility of the dilated and inflamed gum, sympathizing by means of its nerves, which ceasing to be pressed upon, have acquired all their properties, with many other parts and organs of the body, yet it is almost certain that the structure of the gums cannot be an important obstacle to dentition.

33. Indeed, if the organic state of the system, (30)—if the compression of the periosteum (31)—if the resistance of the gum which must be opened by bodies, some of which are blunt (32)—are the principal sources of danger in dentition, why are not these dangers constant and inevitable? Why are not all infants exposed to the disorders in question? Why also does it happen that the period of the shooting (*pousse*) of the teeth, which must not be confounded with the eruption, is often the only period of danger? Why do not brutes partake with men the sorrowful evils of dentition? Why are second dentition and the cutting of the wisdom teeth unaccompanied generally with these disorders? Why is the end of the period of dentition ordinarily more critical than the commencement?

*General Anat. vol. 3, page 95.

34. Rosen,⁽¹⁾ who has paid much attention to the diseases of children, has given out more exact notions of the common causes of deficient dentition. 'When,' he says, 'a child has come to its full term, and is born of healthy parents, and when besides, the mother has restrained her passions during pregnancy—has preserved a tranquil mind and avoided excesses in aliment—and when, moreover, the child has had from its birth good milk—the teeth are always cut easily enough and with little pain. The more the circumstances differ from these, the more difficult is the dentition, and the more danger may be apprehended to the life of the child.' 'A father,' says the same celebrated Swedish physician in another place, 'who is infirm—a mother who gives way to her passions, or who has committed improprieties in eating, during her pregnancy—or a nurse, whose milk is of a bad quality—these are causes of difficult dentition and frequently through it, of death to the child.' (2)

35. Thus the obstacles that impede the organization and eruption of the teeth—the accidents that surround and mark the epoch of dentition, are almost all foreign to the infant. These obstacles and accidents are of several kinds: When we examine them by the light of experience, we find that they depend upon a concurrence of circumstances incompatible with the true precepts of infantile hygiene, and that these evils are more numerous and more serious. 1st. As the nervous mobility of the child is great. 2nd. As its constitution has been radically injured by a succession of errors committed in raising infants. 3d. And finally, as the infant labours under some malady which interferes more or less with the process of dentition, and embarrasses its necessary acts. I will seek under these three heads, the accidents liable to accompany dentition, and deduce from them the most efficacious and certain method of prevention.

1. Treatise on diseases of infants.

2. Treatise on diseases of infants, page 44.

CHAPTER I.

Of mobility considered as the chief cause of difficult dentition.

36. Among the attributes of organized tissues which enter into the composition of living bodies, we remarked the facility with which the solids endowed with life and the sensibility which emanates from it, obey the impression of agents which operate upon them, the promptitude of the movements which result, and the degree of action attending these movements. We remarked also the facility with which the fluids, equally endowed with vital power, and the properties which it gives, yield to the effect that puts them in motion, the activity of their circulation, and the effects produced by their motion. This two-fold facility which is near akin to disease, constitutes mobility, whose results, as they are connected with dentition, I am about to consider.

37. In writing upon the causes of the convulsions of infants* I could not forbear to describe the state of the constitution proper to mobility, or that which favours its different effects. I have shown that this mobility is principally connected with a certain delicacy of the organic tissue, and results from the little density of the molar elements. The same condition is manifested in the fluids, by a greater fluidity, and in the solids by less cohesion. The nerves expand more freely in the solids whose substance is loose, and here they preserve their full sensibility, while in the parts whose texture is close the nerves being strongly compressed, and benumbed, give scarcely any evidence of activity. This we see to be the case in the bones, and in the gums themselves, while in their normal condition, for then they are but little sensitive, but when their tissue becomes engorged, dilated and expanded, as we see in some diseased conditions, they then give evidences of increased sensibility, and manifest the effects of it.

* Treatise on Infantile Convulsions ; their Cause, Treatment. Chap. 1, page 14.

38. By their very nature then, children are liable to great mobility. The gelatinous and albuminous juices abound in their economy; the cellular tissue, the lymphatic vessels and glands, the nervous pulp, the mucous system in general are greatly expanded. To these circumstances are due the plumpness of form, the exquisite sensibility, and the abundance of mucous and serous secretions. Every thing is done rapidly, but with a kind of inconsistency. The child cries and weeps, smiles and chatters almost at the same time. It is easily irritated, and its irritation endures but for a moment. Its motions are quick, but they are feeble; its excreted fluids are large, but they retain much of their nature; the seal of the animal is scarcely impressed upon them, and he can hardly perceive in them the debris of the body, which is decomposed to be renewed. The appetite is great, the digestion quick, and nevertheless its products are not well assimilated. In a word, all the functions prompt to act, but incapable of long continued effort, are excited and languish; again exerted and suspended, showing an inconsiderable medley of activity and inertio of force and debility, in the midst of which, and in spite of the predominant condition of imperfection and weakness, we discover traces of that power which can raise the child to manhood, and enable it to triumph over the dangers which menace it on every hand.

39. It was in view of these great truths that the celebrated commentator of the great Boerhaave, remarked that undoubtedly the tension and irritation of the gums frequently caused the most violent epileptic attacks in children during dentition, while adults could bear without the least symptom of convulsions, the most cruel tooth ache and the severest cholic. Moser* has enlarged upon this idea, and confirmed the truth of it.

40. Every time that the effect of impression and sensation shall be very much greater than is proportionate to the cause that produces it, the mobility will exist in all its fulness, and dentition will be dangerous through this very excess of mobility. This assertion needs no further evidence than an examination of the gums during dentition, and the connexions which these parts have with different organs and their functions.

41. As long as the organization of the teeth causes no pain in the alveoli, the bones and the compact tissue that covers them undergo no

* Dissert. Med. de ortu dentium et symptomalibus quæ circa dentitionem securrunt, page 24.

change of structure or condition. The nerves that are distributed throughout this tissue are compressed, and manifest only obscure sensibility. Nothing occurs in the mouth that can put the general sensibility to the test, and the system at large receives no impairment. This is the state of a child, until the fourth month. Until this time, the alveoli, whose borders had been but little elevated, and whose cavities were still shallow, had been the seat of no operation that could influence the living economy. But after the epoch just indicated, these same cavities are prolonged; the osseous borders which constitute a part of them, dilate and elevate themselves; and the alveoli, which at birth, and for some time afterward are depressed, enlarge, project, and press upon the gums. This is the period when the teeth are forming and preparing to pierce the gum.

42 The gums receive many threads of the two last branches of the fifth pair of nerves; but considering that they enter a very compact tissue, we infer that they impart but little sensibility to the gum, which indeed is the case. But when the gums swell and distend, their sensibility, at first latent, develops itself and becomes more or less exquisite. What we have said of the gums, applies also to some extent to the serous membranes, that form the alveolar and dental periosteum.

43. By means of the nerves above mentioned, the gums and the periosteum have relations with many parts of the body, particularly with the viscera of the chest and abdomen. These relations are established by means of two nervous threads that the most anterior branches of the fifth pair of nerves furnish to compose, when joined to the threads that the sixth pair give off, (according to many anatomists,) the origin of the great intercostal, or sympathetic nerve.

Anatomy teaches us that the great sympathetic furnishes branches to the viscera of the chest and abdomen, and that it communicates also with the nerves of the neck, and those of the superior or thoracic, and inferior or pelvic extremities, by the means of gangliens, which we find on dissection, near the origin of the greater number of the nervous pains that come off from the spinal marrow, which furnish to this great sympathetic nerve a quantity of nervous filaments, which increase it and extend its intimate relations with the other nerves.

44. The gums and the alveolar and dental periosteum contain also many blood vessels. We know that the gums are subject to en-

gorgement and to hæmorrhage, and thus the blood must readily percolate their tissue.

45. From these anatomical truths, we must infer that when the gums and the periosteum are affected with irritation, rupture or inflammation, the disorders incident thereto may readily be propagated to these parts of the body which have direct relations to them, and there produce serious consequences, and this the more easily in proportion as the parts are predisposed to disease by extreme mobility.

46. The mobility natural to the first ages of life, and which when excessive, disposes to maladies of various kinds, and above all to the disorders which are exhibited in dentition, is met with in two different and opposite states of organic tissues, viz: with relaxation or debility, or with tension and crethism.

47. In the atonic mobility, there is a loose cellular tissue, a whiteness of the skin; the mucous and serous secretions are abundant; the countenance is mild; the eye not brilliant; the temperature low; children under these circumstances give glaring dejections and milky urine; their transpiration is acidulated (*acido-donceatre* ou *acido-fade*.) Their complexion looks well, but the flesh is soft. They have little vivacity, weep little, and when compelled to cry, their cries are not strong. They manifest but little temper. They do not suck eagerly but remain long at the breast; sleep soundly and for hours together. In a word this is the lymphatic temperament, which is said to be proper to infancy, when its effects extend throughout the moral and physical system.

48. The mobility that accompanies or determines crethism, presents itself differently. The childrens' bodies are slender; their limbs delicate; they are lively and petulant. Their colour is florid; their countenance and eyes animated; they suck little, but frequently; their sleep is short and light; some of them are petulant and cross; they pass but little water, and their tongues are stained of a yellowish colour. Their dejections are often of a deep yellow. Their temperature is elevated—we might say that the temperament of such children partook of the bilious and the sanguine. In short, as the former (47) are phlegmatic and sluggish, these are lively and petulant.

49. The accidents of dentition in the first of these conditions, are most frequently a slimy ptyalism with relaxation, and whiteness of the lips; a clammy tympanitic condition of the lower belly; a mucous and

glairy diarrhœa; moist eruptions with pale crusts; and finally that kind of eclampsia and epilepsy which M. Saillant has thought to depend essentially upon a thoroughly lymphatic constitution, and to be caused by a mucous and aqueous engorgement of the brain.

50. In infants with whom mobility is united to erethysm, (48) the temperature of the body is elevated during dentition; the mouth is dry and hot, and the children drink readily; the lips and the carunculi laceymales are red, the diarrhœa is serous and acrid, and the children have redness of the arms; sometimes excoriations, and transient inflammations. If eruptions break out, they are scattered over the face or the hairy scalp, and their colour is a bright yellow. These children are threatened with fever and convulsions.

51. Mobility then, and the disposition of body which it creates or cherishes, does not always exist under the same forms, and consequently demands different management and treatment. The atonic mobility demands pure and fresh air, animal nourishment, dry frictions over the whole body, cold baths; in a word all that can invigorate the constitution, diminish the quantity of lymphatic and mucous humours, vivify the solids and fluids and render their functions more regular and more natural.

52. The sthenic mobility having for its foundation a *tension* that may be taken for real strength, requires air somewhat humid, vegetable diet, warm or tempered baths, means proper to relax the tissues and to allay the heat disproportionate to the exercise of the functions.

53. This distinction gives the proper place both to the eulogiums and the reproaches which have been bestowed upon different methods of preservation and cure. These have been recommended in too general terms, and without regard, if not to the predominant condition of the system, at least to the particular constitution determined by the state of the organized tissues.

54. There was a time, when by the advice of Jean Jacques (Rousseau,) the rearing of children was conducted upon a plan, not *hard* but *cold*. The children almost from birth, were scantily clothed; they were washed with cold water; they were plunged in buckets of the same—and physicians have approved these proceedings. Raulin says that he saw children, who were scantily clothed, and accustomed to cold water, become strong and robust. He says that the greater part of them went almost naked during the most extreme cold of winter

without appearing to suffer from the exposure.* A great number of good medical writers recommend these means, as the only ones that can counteract excess of mobility, cachexy, rickets and difficult dentition.

55. M. Duval, in a work called 'le Dentiste de la Jeunessè' has neglected nothing that can condemn the use and application of cold. By the strength of the authorities that he brings to the support of his opinion, he gives reason to fear that this method will harden the skin of children and impede their growth; a condition which at the epoch of dentition shows itself by putrid stools of an alarming character, as the translator of Rozen has remarked.

56. Thus to listen to the opposers and the partisans of a practice, one might suppose that the healing art rests on bases uncertain and continually shifting. Indeed, this is unhappily too true in the case of a great number of physicians, who look only at the remedy, and disregard the indication. Every day much good and much evil is done by the same means. It is only the well-instructed physician who honours the science, and displays his knowledge by administering remedies, and varying his practice according to the rational indications.

57. In choosing wisely between the warm bath and the cold, the physician will have at his disposal one of the greatest resources of the healing art, against the mobility which it is important to modify before dentition. I have seen weak and drooping children, bathed every morning and evening in cold wood ley, recover rapidly strength and gaiety. The alkaline quality of the bath cannot add much virtue to the action of the cold thus applied to the body. I am informed of a mother of a family who had lost three children in dentition, who succeeded in saving two others born subsequently, by beginning to bathe them in cold water when a month old, and continuing the practice from day to day during the first year of their life; but these children were in the condition of those spoken of; (47) and in them was evidenced the good effects of cold applied with *judgment*.

58. M. Raulin has advanced the opinion, that this remedy is especially proper to give to the solid fibre an elastic tone, which is communicated to the vascular membranes. Hence he says, the circulation of the fluids requires activity; the blood becomes more dense, and more capable of action and resistance. Strength is com-

* *Traité de la conservation des enfans*, tome 11, page 126.

municated to the limbs, the viscera, &c., their functions are performed more perfectly, and with regularity.⁽¹⁾ Above all, it is the transpiration, according to Lieutaud,⁽²⁾ which is regulated by cold baths. So also say Tissot⁽³⁾ and M. Durando;⁽⁴⁾ and this advantage certainly is one, which renders the remedy very valuable. When the functions of the skin are freely performed, harmony subsists in the different physiological acts, and generally the viscera are greatly benefitted.

59. When to the use of these means are added sufficient clothing, fresh air, dry frictions, which most efficiently second the action of the cold bath, and the use of moderately hard beds; almost every thing is done that is necessary to repair a bad constitution, a soft temperament or phlegmatic habit. Does not experience teach us, that more children who have been brought up delicately die than others; and that provided we do not exhaust their strength it is better to keep it in action than to husband it? Nevertheless we must not forget the testimony of M. San Montin⁽⁵⁾ in reference to the Laplanders, one half of whose children he tells us, die within the first year from the effects of cold, to which they are exposed for the purpose of hardening them.

60. Doubtless, warmth is necessary for the new-born infant. Its weakness, delicacy, and the frail state of its life, together with its transition from a place of warmth and moisture, all indicate the sort of care that is necessary to prolong its life. A soft bed, pliant and warm covering, sleep, darkness, air, the warmth of the mother or the nurse; warm baths, as means of cleanliness; these are the aids it needs: but this does not hinder that the treatment soon be modified. Provided proper gradations be used, all may be accomplished: When an end is determined on, the only question for wise men is the best means of attaining it.

61. All that I have said about the utility of the cold bath and hardy life, for children of too great mobility, to whom it assures an easy and safe dentition, does not prevent me from speaking in the highest terms of the warm bath. Immersion in a bath of this temperature,

1. *Traité de la conservation des enfans*, tome 11, page 74.

2. *Precis de matiere medicale*, tome 11, page 5.

3. *Avis au peuple*, page 404 and 406.

4. *Gazette de Santé*, an 1774, page 250.

5. *Disert. historico-medica* Le Medicina Laponum.

brings the body into contact with the caloric of the water, and we know how stimulating heat is, and here it animates the functions. Hence it is useful to children, who languish only from debility, and who are feeble, merely from want of a sufficient quantity of the general principle of heat and life. Persons who speak from theory, are led at first to exclude the warm bath, on account of the vulgar prejudice against its action. They say "the warm bath relaxes and weakens," when it is incontestible that it animates, restores and sustains, the strength. Thus we may produce the same effect from opposite means. Nevertheless, I do not think that it is altogether indifferent whether we use the warm bath or the cold. One cannot long experiment upon this subject without discovering that the warm bath acts more promptly, and that the effects of the cold are more enduring; that the warm suits better in great debility, the cold in general relaxation of a less degree, and as nothing of the kind is absolutely good or bad, circumstances only, must decide between them.

62. In general, if immediately after a cold bath, the infant remains pale and more or less benumbed; and if any of its limbs appear contracted after the child has been dressed and rubbed with warm cloths, then not only will the cold do no good, but it must be abandoned for fear of harm. It is then that the warm bath must be preferred. A father of a family who had adopted the cold baths in the physical education of his children, has observed, that the cold baths should be suspended during dentition; because the whole system is then undergoing modification, and the application of cold might occasion very great irritation. Indeed, we are warned of this necessity by a sort of dread which the child shews of the cold bath at this period, though formerly it may have appeared to be rather agreeably affected by it than otherwise.

Thus cold baths may be a good means of preventing the effects of mobility before dentition; or, on the other hand, of developing this mobility upon which the unhappy results of this process depend.

63. The cold method is very useful for the children whom charity has assembled in the hospitals; provided that at the same time the air of the rooms be purified by alkaline vapours. From the results of the attempts to raise nursing children, in communities, as in the hospitals for "*enfants trouvés*," it is evident that the air of the apartments in which they are congregated, soon acquires such bad qualities that the difficulty of raising them, and their mortality is very greatly increas-

ed by assembling them together. The little things are a prey to maguet :* and it has been thought that this morbid affection, the principal symptoms of which appear in the mouth, is the result of putrid and contagious miasma. But the physical condition of these children, feeble and exhaling acid, shows plainly that their state might be improved by the use of cold water, while at the same time, means should be used to neutralize the acid vapours that their breath and transpiration diffuse through the room. Children abound in gelatine and albumen ; the degeneration of these animal substances is known, as the children emit the odour of sour dough, at the same time there is something of a putrid nature in these emanations. Albumen is very liable to putrefaction.

It is useless to remark that this period of putricity is not that which should be chosen for purifying the atmosphere with alkaline vapours.

64. Is it in circumstances analogous to these that Professor Mitchell, of Philadelphia, has proposed to combat the contagion with alkalis? while all true and close observers agree in establishing the good effects of acid vapours, in disinfecting places imbued with contagious miasma.

65. I have said (52, 62) that the warm bath or the tempered bath is suitable for children whose too mobile constitution suffered through erythism, heat, and too great activity ; while the cold bath is proper for those who are endowed with a contrary constitution. For these, the warm bath effects every thing—moderating their heat, relaxing gently their tone, and tranquilizing their system.

When the children profit by the bath, they grow well ; and sickness and pain are not likely to assail them. Bathe in warm water a child whose skin is too hot and dry, and whose belly is bound up, and you will see its members unbound, its bowels loosened, and its whole frame to be gently and healthfully relaxed. It is for constitutions such as these, that the author of the book *De Salubri victus ratione*, attributed to Hippocrates, has said, that by the use of the warm bath a child is fortified against convulsions, assisted in its growth, and gifted with a fresh and rosy colour.

* *Maguet*, is a disease common in the French Foundling Hospitals. It usually occurs in very young infants, sometimes when only a few days old. In this disease the mucous membrane appears covered to a greater or less extent, with a white milky or curd-like concretion at times covering the whole surface as if the child's mouth were lined with cream or curd. We have seen it to such extent that the white fluid exuded from the nostrils. It is sometimes dependant upon aphthæ, but may exist without ulceration.—*Evanson and Mannsell practical Treatise on management and diseases of children*, page 216.

66. The cold water may be used when the application of cold seems to be proper, by sponging the entire body of the infant with it; but when heat is required, we cannot use it in a similar way. The warm water, which is the means of warmth employed, cools very readily, and if applied in this way would produce an effect much like that of cold itself. Hence the child must be plunged into it.

67. Let no one mistake the proper application of the cold and warm modes of treatment; and let no one confound *healthy* with *diseased* conditions. A child in health requires nothing more than the general means of abundant and well regulated nourishment, &c., but a child, excessively mobile is sick already. If you wait until the time of dentition, there will no longer be leisure for remedying the vices of constitution that may render this process dangerous; then we must use a treatment suited to the complication of evils that must be directly treated; before this period we have nothing to do, but to manage wisely the resources of preservative care.

68 As clothing makes a part of this management, it is necessary for me to say a word about this. Much has been written on the advantages and the dangers of the mode of swaddling infants. Swaddling clothes have been in use too long and too generally to permit us to suppose that they are injurious, as has been said. They may be injurious so far as they hinder the free movement of the limbs at an early age, when these movements are *exercise*; but they invest the child warmly, and prevent the consequences of chilliness which must otherwise affect infants, after wet with urine, and transpiring freely. This is not all. The swaddle is useful in the atonic mobility. This species of bandage supports the flesh, and hinders the distention of cellular tissue, and the consequences that might result from it. In the sthenic mobility, the bandage is of doubtful efficacy. Lively, restless children, need freedom of motion. Restraint fatigues them; loose clothing relieves them by permitting all kinds of movements, and they are refreshed by contact with the air. In prescribing the swaddling clothes, the children are kept cleaner; and this is a very great advantage. In mobility with erythism, extreme cleanliness is even remedial.

69. We have seen, (51) that animal nourishment is eminently suited to cases of asthenic debility; and (52) that vegetable nourishment is very appropriate to cases of mobility with erythism and tension. But we are now treating of infants at the breast, and even of

the very youngest of these. They are confined to milk as their only diet, and if any other is substituted for it, the prejudice of nurses and mothers forbids the use of scraps or vegetable creams, or porridge. But reason and observation more valuable still, ought to undeceive them, and physicians and accoucheurs, should lose no opportunity to impress upon them the necessity of so managing their children, as to overcome the natural vices of constitution, among which morbid mobility ranks high, as particularly dangerous.

70. It is evident that animal food repairs the strength more promptly than vegetable can;—that the former is more heating than the latter, and that among all the means of invigoration through aliments, nothing equals the juices of animal substances. Let an infant subject to acidities, and mucous and glairy dejections, languishing and feeble, be fed, not altogether, but in addition to its milk, with well prepared broth, or with the juices of roast meat, and we shall see a great change to its advantage. Its constitution is strengthened, the body warms, the green and glairy passages are suspended, the colour improves, the child grows fat, and the mobility disappears. Thus, without medicine by the use of proper aliments alone, its constitution is ameliorated, and the catastrophes of critical periods are averted.

71. Sweet and cordial wines, such as the Spanish wines, contribute much to produce and continue these results. This, however, is no more in accordance with the notion of nurses, than the use of animal food.

72. But this animal nourishment is as unsuited to meagre and warm children, as is the vegetable nourishment which is proper for them, to restore vigor to children soft and fresh in appearance. This vegetable nourishment consists of the creams of bread, rice, potato-flour, barley, &c. In the second chapter I must speak again of the nature of these aliments and the mode of administering them. It is sufficient to mention them here among the means of cure of morbid mobility—a cure which is one of the circumstances most favourable to the success of dentition, and which it is necessary to secure in advance; for when dentition has arrived, there are other indications to be met, very different from those acquired by mobility.

73. It is to this (mobility) that we must attribute the precarious and the tardy dentitions, often alarming and sometimes fatal, that are spoken of in the writings of observers. When there is irregularity in the acts of nature, one is sacrificed to the vigour of others. M.

Duval speaks of the son of a Prussian nobleman, aged eleven years, at which time the two great incisors of the first set of the superior jaw had not yet appeared ; and his feeble condition gave ground for fear that he would be deprived of these teeth altogether, had not the swelling of the alveolar margin given hopes, that by renovating the strength of the child, the retarded teeth might yet be cut. Baths medicated with the husks of expressed grapes, and an appropriate regimen produced the desired effect. *

CHAPTER II.

Of errors committed in the mode of raising infants, considered as the chief causes of difficult dentition.

74. The very important subject of this chapter has direct reference to dentition, since an infant, well made at birth, will soon acquire serious vices of constitution if it be raised in a manner unsuited to its wants, and contrary to the end of its organization. We find at the end of Huxham's treatise on fevers, an essay on the manner of nourishing and raising children, in which there occurs a very sensible passage, in point. Dentition, says the author of this essay, is considered with reason to be dangerous to infants, but it is not so in the order of nature. Every day's experience proves this ; for if dentition were a malady we could not enjoy good health until twenty-two years of age, since we are getting teeth the greater part of that time. Although this operation of nature be accompanied by fever, convulsions and many other troublesome phenomena, yet we find so many cases of exemption that it would be improper to consider these accidents natural, and to hide the fact that they proceed from a

* La Dentiste de la jeunesse, page 28.

too great fulness, or from the corruption of humours put in motion by the pain of dentition. It is true that the eruption of the teeth is scarcely ever unattended with pain and indeed a little fever ; but when the blood and the humours are neither acrid nor too abundant, these accidents are so inconsiderable that they gradually disappear without any consequences.

75. Bad air, motion and repose, sleep and wakefulness, even the secretions and retentions, exercise less decided and pernicious influence upon the health of infants, than do aliments and regimen.—Therefore this article requires particular consideration.

76. Does any one doubt that errors of diet and abuses of regimen occasion difficult dentition? To prove it we need but some reflection. No one will deny that an almost necessary consequence of errors of regimen is the amassing of hardened fæces ; the enfeebling of the digestive organs, and as a result of this, a bad preparation of the chyme and the chyle—These depraved matters are not fit for nutrition ; they occasion the wasting away of the nurslings, and determine or aggravate the mobility that destroys the good constitution of infants at the breast. We know that at the epochs when organic developments are made, there is always some degree of mobility which augments in proportion to the difficulties attending any such development. Therefore, how can a body already enfeebled and containing within itself different morbid foci, support the always long continued irritation which accompanies dentition, without its mobility being greatly heightened, and without serious results in consequence of it? How can it be that the humours whose qualities have been vitiated, when carried to the mouth (not by a predominance of the brain's action, a predominance which exists no where but in the imaginations of theorists, but because the formation and eruption of the teeth established in the jaws a fixed point of irritation,) How can it be that these vicious humours will not augment by engorgement the phlogosis and its terrible consequences? How can it be that when the primæ viæ enfeebled and irritated, contain a great quantity of vitiated secretions, always ready to be absorbed and to pass with all their bad qualities into the secretory passages, a fever will not be lighted up sufficient to involve the whole system in fearful disorder?

It is in reference to these different circumstances, the causes of which act far more powerfully upon the children of the rich than

of the poor, that Rozen Ludwig, and Mozer have said that the children of the great escape with more difficulty the dangers of dentition.

77. Many facts add great weight to these assertions.

Among these facts, which it would be easy to accumulate, we may remark the following. It is known to physicians and even to nurses, that a moderate diarrhœa is a salutary and desirable evacuation during dentition. They are not ignorant that the fever which accompanies this evolution is considerably abated by the stools. According to the observation of Hippocrates and the experience of those who have devoted themselves to the care of the health of infants, nurslings, full and plethoric, those whose belly is hard and costive, run great risks in dentition. We may add that animals who are not troubled by the abuse and errors of regimen know nothing of the dangers of this epoch.

78. I pass to another kind of proof. Robert Bland ⁽¹⁾ in England, Nils Dalberg ⁽²⁾ in Sweden, and M. Raymond ⁽³⁾ in France, from tables of mortality prepared with care, have proved that from the defect of good aliments and suitable clothing, women of the indigent class, who are very fruitful, have great difficulty in saving a small proportion of their infants. We know the striking statement communicated by Dr. Harris, of the prodigious number of nurslings that were provided for in a parish a dozen miles from London, in a healthy and airy place, of whom all but three died within a year, through the fault of mercenary nurses. ⁽⁴⁾ The learned M. Gilibert has very carefully observed children nourished with bad aliments and without proper regulation as to quantity of food, and of these he declares almost all perished before they were nine months old ! ⁽⁵⁾

In these and similar facts, do we not see strikingly exemplified the pernicious influence of bad regimen on the period of dentition, and a respective augmentation of mortality during this process, among badly nourished children ?

79. If regimen exercises such power over dentition, it is important to understand the errors and abuses of it, in order to describe the ob-

1. Transact. philosoph—tom. lxxi. 1781. part ii.

2. Tal om Nægradet suens, etc. 1778.

3. Mem. sur la topographie de Marseille. Mem. Sac. Royal de med. An. 1777,—8.

4. De morbis infantum, page 7.

5. Disser. sur la depopulation causée par les nourices mercenaires, page 319.

stacles, that obstruct the process in question, and to discover the causes of the accidents that occur at this time.

80. The first and undoubtedly the most dangerous of these errors, is in giving the very young infant milk of a bad quality. If the matter which is to repair and sustain the parts is acid and vitiated, these parts, receive in the very agents of nutrition the elements of destruction. With milk of this kind the children acquire sthenick mobility. It is not to medicine that we must go for relief in this case, but to fresh and properly prepared milk; such as that which after the accouchement fills the breasts of the mother. This passes by gentle gradations from a degree of tenuity to a consistence almost creamy; for nature has wisely regulated the quality of the aliment she destines for the infant, according to its capabilities of digestion. Unhappily all mothers cannot nurse their children. This is restricted to healthy and vigorous women, and such should blush to refuse to nourish their children. They who do so merit the humiliation endured by the mother of the natural brother of Gracchus; this young Roman when he returned from a military expedition, brought to his nurse more magnificent presents than he did to her who had given him birth. 'My mother,' he said, you carried me nine months in your bosom, but as soon as you saw me you abandoned me. My nurse received me gladly; she carried me in her arms and nourished me with her milk for three years—all she did was voluntarily done. You carried me in your bosom and nourished me with your blood from natural necessity. I feel more indebted to my nurse than to you, and I wished to show this by the difference of my present s!

81. It is not to be supposed that it is always impossible to hire a good nurse. Experience proves the contrary; but to fulfil all the functions of a nurse, it is necessary for the woman to have that maternal tenderness that would expose her own life to protect that of the child. She must also have that maternal love that will cause her to control her diet and her appetites; she must have that maternal patience which will fit her to watch over the child and guard its cradle from pain and disease. Are these qualities to be found in many nurses? This is not the place to enumerate the causes of depopulation which are found in the vices, prejudices and blunders of mercenary nurses; causes which Dr. Gilibert has thoroughly analyzed; nor to insist upon the different considerations that make nursing by the mother a sacred duty as well as a salutary obligation. I will

only say that in preferring the milk of a stranger there is risk in giving bad nourishment to the child; either because it may be less suitable to its constitution, or because of its too great or too little tenuity. Milk too thick will produce a part of the effects of indigested aliment, of which I will speak presently; milk too serous for a robust child, may produce too great mobility, after having caused a degree of decline and inanition.

82. To be of good quality, milk ought not only to be furnished by an excellent nurse, but her regimen should be salutary, for the milk retains the qualities of the aliments made use of.

83. An excellent nurse should be of good morals; and indeed of fine physical qualities. Her age ought to be between twenty and thirty, and the colour of her skin natural. Her eyes should be lively and animated; her hair and her eyebrows brown or light coloured, her lips red, her teeth sound and good, her gums hard and well coloured. She should have sweet breath; the nose unobstructed, and exhaling no odour—the neck sufficiently long, the chest large and well arched; her breasts ought to be loose, firm and distended; elastic and moderately large; with the nipples sufficiently imitable to be firm when the finger is passed under them, brown, long and thin;—placed upon the middle of the declining part of the breast, in the midst of an elevated areola of an obscure red colour. Her milk should have a sweet smell, its colour should be a little dull, and its lustre a little bluish and semi-transparent. It ought to sustain the proofs of its goodness; such as the following.

84. Put a drop of the milk on the nail, or a certain quantity on a china plate, and incline it slowly and cautiously. If the milk runs too fast and without leaving traces it is too serous; if it does not run except with difficulty and leaves much behind it, it has the opposite quality. Let a drop fall into the eye to test if it has any acidity—mix it with water to see if it dilutes easily. Taste it to know whether it be too sweet, saline or bitter; and finally heat it with acids, and let it stand to see whether it abounds too much in cheese or cream. M. Spielman has obtained from two pounds of woman's milk, an ounce and a half of cream, which gave him six drachms of butter and a half ounce of very delicate cheese.

85. As to the other qualities of a good nurse, it is necessary that the hereditary diseases of her family (if any) should be inquired into. She should neither have leucorrhœa, nor an open issue; indeed an issue recently closed ought to be an objection. The nurse should be

perfectly free from cutaneous eruption, hysteria and habitual convulsions. It must be ascertained that she has not already nursed children with eruptive disorders. Pregnancy is a doubtful objection.* She should not be passionate, rude, capricious, nor a tippler in intoxicating drinks.—Inquiries into these matters cannot be too minute.

86. As to the regimen necessary for the nurse, it is not necessary to make great and sudden innovations upon previous habits. Experience has proved that these result unhappily. Linné has made very sensible reflections upon this subject.

He says nurses are most often chosen from the poorest class of females, and are such as have been obliged to abandon their children, or those who have lost them. As these have from their childhood been accustomed to gross food and active labour, and suddenly are transferred to houses where they are idle, eating and drinking much, and subsisting entirely upon succulent food, they are soon tormented by plethora, melancholy and luxury. They become heavy, lascivious, and sad; for every body knows that a sudden change from gross food and violent exercise, to an abundant diet and absolute inactivity, develops a spontaneous acid. The mother may scarcely feel the slightest effects of this, but the infant becomes the victim—and in consequence becomes subject to colic and vomiting. The milk coagulates very strongly; the stomach swells and becomes hard to the touch—it cannot digest the milky mass. The excrements are green, the face pale; eruptions appear upon the skin, and the scene at length terminates in fever and convulsions. (2)

Can dentition be regular in the midst of these evils? Must it not aggravate them seriously?—

87. When a nurse who has had her milk for some months is charged with the care of an infant from birth, she ought to modify her aliment so that her milk may improve in freshness and tenuity. For this purpose she may use a drink of a character likely to produce this effect: such as an infusion of the fresh root of the *chien-dent* (dog grass,) in which some bruised aniseed is thrown; or a decoction of the fresh root of *scorsonere* with fennel seed; a watery infusion of liquorice root, or any other drink of the kind. †

* See Baum's treatise on infantile convulsions, 2d. edition page 84.

† I have no faith in the virtue of these or any other herbs to effect the purpose for which they are here recommended. Abundant drink may be necessary—and as warm water is disagreeable and offensive to the stomach, it must be rendered palatable by the addition of something innocent and aromatic.—The choice may be left to the nurse. (Translator.)

88. Such precautions are less necessary when the proper mother of the child nurses it for fifteen days or a month. Her milk possesses qualities the most proper to evacuate the meconium, and cleanse the bowels of the infant.

89. It does not suffice that the milk be of good quality—it is also necessary that the nurse shall permit the infant to take it only when it is required. Unfortunately women are persuaded, and not without a show of reason, that an infant ought to nurse the more frequently in proportion to its youth, because of the great rapidity of nutrition, and the abundance of the excretions. On this account the breast is given them at very short intervals. Gorged with milk, the infants reject it without effort or in a fit of hiccough; but nurses regard these salutary vomitings as a loss of aliment which must be prepared, and they again offer the breast. This course is continued; the stomach becomes accustomed to throwing off its contents, or is enfeebled; the digestive powers are weakened—hence acid or glairy matters form and multiply in the mesenteric organs, and the health of the child is either destroyed or prepared for destruction at the period of dentition.

90. All wise and experienced physicians have pointed out the effects of this sort of dietetic error. M. Gilibert has treated this subject with great truth. According to him, nurses almost always err through ignorance or prejudice, with regard to the manner of nursing infants. Many of them, persuaded that good milk can never do any harm, make their children nurse almost constantly. Now all physicians agree that at all periods of life, there ought to be a proper interval observed between the times of eating; it is evident that if the stomach be filled with new aliment while it is engaged in digesting that which has already been taken, the preparation of the food for assimilation will be imperfectly performed. The chyle will be crude and of bad quality. Infants are more exposed than adults to the disorders that this mistake occasions. Their digestive organs are delicate and feeble. If they are made to nurse before the milk already taken be digested, the new curd that is formed hinders the digestion of the old. Hence arise wind and colics. The milk sours; occasions convulsions, obstructions, marasmus,* evils common to badly nourished children, and which make their ultimate assaults during

* Dissertation on the depopulation caused by mercenary nurses, page 316

dentition, and often obstruct this process with obstacles that are not overcome.

91. The daughter of a grocer had been nourished by her mother, under all the prejudices of a vulgar woman; at the end of the fourth month commenced to fall away through a considerable diarrhœa. The anterior part of the gums swelled and were very painful. Inflammation took place, apthæ spread themselves over the mouth, cough supervened, the jaws were puffed up, as they appear in the disease called 'fluxions sur les dents;' the diarrhœa became colliquative, and the child being no longer able to take the breast, fell into stupor only interrupted by moans; convulsion succeeded, and the little sufferer expired without having been able to cut its first incisor teeth.

This example strongly proves the reciprocal action of a bad regimen on dentition, and of dentition upon the disordered condition of the digestive organs, produced by such a regimen.

92. A consequence of the morbid results of which we have just spoken, is that it is necessary to begin early to form a good constitution for the child, and to procure for it by means of a good regimen, a dentition exempt from unnecessary inconveniences. On this account, a child should from its very birth be regulated, both as to the quantity of milk it takes, and the number of times it is permitted to take the breast. I have known very respectable women, of very high rank, who while nursing their own children at a time when such a course was not common in fashionable circles, had the courage to accustom their infants to a certain number of nursings in the twenty four hours, and their success induced many good mothers to imitate them.

93. When an Infant has taken a sufficient quantity of milk and yet cries, it is not from hunger but from some other cause. Probably it is from wind, which may be dissipated by the application of a warm cloth to the bowels, or by gentle friction with a fomentation of aniseed water, chamomile, or orange flowers. As long as it cries it should not as a general rule, be permitted to take the breast.

94. The state of the child's health, the strength of its constitution, and the quality of its dejections, ought to decide the quantity of milk it may be permitted to take, and the number of times of nursing it. When the breast is full, hard, and a little painful, nurses are in the habit of pressing infants, by patting them upon the back, to empty it. This ought never to be done. It is better that a good nurse should lose her milk from her nipples, than incommode her infant.

This only happens when the child is very young. As it grows older, it becomes eager to empty the breast, and every nurse knows by this sign, when the child thrives and when it takes aliment enough.

95. The abuse which women make of their milk; the idea, very often false, that milk alone is not sufficient for the nourishment of the child, and the rapid growth of the infant, have led nurses to give even to very young children, additional food; and this custom has not yet been discarded. Nurses are very fond of routine; they have local customs, and the councils of old women, grand mamas and duennas, exercise a dangerous despotism over the minds of the young mothers and inexperienced nurses.

96. The additional food of which we speak, is in many countries a preparation made of wheat flour, or that of some other grain, boiled in water, cow's or goat's milk, or even in broth, thickened on the fire. This preparation has received the name of bouillie. It is indigestible, and is very improper, as its basis is an unfermented and very fermentable substance. All the authors, who have treated of the hygiene of infants have protested against the use of bouillie; and their opposition has not been unnecessary. Notwithstanding the great mortality of young infants, and the difficulty of preserving them beyond the first year, every thing leads us to believe that in most cases, death is owing to errors in their physical education; and prominent among these is the abuse of bouillie.

97. In other places where bouillie is unknown, the cream of bread is used, called *panada*, from its principal ingredient. This preparation which contains nothing unwholesome may be made of white bread broken or crumbled in water, milk or broth, cooked over a slow fire and flavoured with a little aniseed. Yet it may become unwholesome by cooking it until the glutinous parts of the wheat forms a viscid and gluey substance. This is a kind of bouillie, and its bad effects should be pointed out.

I have spoken of this preparation in my treatise on the convulsions of children, but I must repeat in this work my remarks upon the great abuses in the physical education of infants, and present additional evidence, to that I have already adduced in my other writings on infantile medicine.

98. Bouillie and panada are more heavy for the stomach than milk, and we have seen (89) that this aliment is often injurious in early infancy.

These preparations engorge the delicate vessels of the mesentery ; the gross chyle which is made from them, stopping in the glands, which are only bundles of lymphatic vessels folded upon themselves. Authors have enumerated among the effects of this improper aliment, diarrhœa from obstruction of the mesentery, atrophy from defect of nutrition, and all the maladies which are produced or aggravated from this cause.

99. I have seen the infant son of a lawyer, which was nursed by a woman who had not sense enough to abandon the prejudices which I am combatting. This child, whose constitution had never been strong, acquired a large belly, which grew hard ; its head became too large in proportion to its body, but with these exceptions it reached the age of eight months without serious disorders. At this time a diarrhœa supervened, which became colliquative ; the stools were watery, deep green or greyish, and colic, wind, and pain in the gums tormented the child, which died in convulsions without having cut a single tooth.

This case supports the one recorded in paragraph 91, and is a new proof of the danger of the improper aliments, upon which nurses persist to feed infants at the breast.

100. Unhappily such aliments (96 and 97) as they use, enfeeble the tissues, and give to the children an appearance of enbonpoint and health. Nurses who take pride in having their infants fat and sleek, confirm themselves in the propriety of the course upon which we are commenting. When serious diseases occur, they blame dentition which is a natural process ; worms which do not exist ; and fever which is but the effect of bad nourishment. Death carries off the victim, and the next infant that falls into the hands of the nurse, is ordinarily no better treated.

101. We can give no more countenance to those nurses who wish, as they say, to accustom their children to eat every thing, and to make them 'a good stomach,' while they have scarcely got their first incisor teeth. For this purpose they give them bread and meat, which they (the nurses) have somewhat masticated ; in fact anything of which they eat themselves. They are not even sparing of those aliments which generally disagree with infants at the breast. Thus the stomach, so far from becoming strong, grows feeble, the disorder of the bowels increases instead of being remedied, the children die, instead of living healthy and vigorous.

102. From these abuses proceed colics and sleeplessness. The nurses have their own pharmacy for these. Sometimes it is the oil of sweet almonds, to which they have recourse, sometimes they administer the diacodian syrup or that of white poppies, or theriaca. A nurse of one of my children was in the habit of giving it a quantity of pure wine to stupify it. This infant, nursed in a village, and intrusted to a woman of good appearance, was threatened with rickets; it was tardy in speaking, has still some difficulty in articulating words, and has suffered with its teeth.

103. Since regimen is a point of so much importance, that both the diet of the nurse and the infant may produce changes which seriously influence dentition, it is well to review this matter in detail, and in applying it both to the infant and the nurse, to mark out the rules of conduct which should be observed by each.

104. The dietetic means necessary to preserve nursing children from the accidents of dentition, have reference to the course necessary to be pursued from the birth of the child until the time of dentition; and to that which becomes proper at the time in which dentition is about to be effected, and during this process.

105. In the first period, anterior to the actual eruption of the teeth, it is necessary to shun the abuses and the errors of physical education, of which I have taken pains to give warning. Infants are intended to subsist upon milk during the first months of their existence, and whatever nurses may say to the contrary, milk is a nourishment sufficient for them. This is by no means an entirely vegetable aliment as some philosophers or demi savans would have us believe. It is a well animalized substance. It contains all the elementary principles of living bodies, and nature, who is not blind, because her Author is supremely wise, has provided it with materials which abound at the epoch when they are wanted. Thus the phosphate of lime is furnished most abundantly, when the process of ossification particularly requires it.

This is confirmed by the analysis of milk lately made by Messrs. Fourcroy and Vauquelin, and by M. Thenard; according to them, milk should be considered a mixed liquor, consisting of a large quantity of water, and of two kinds of matters; the one class completely dissolved, as sugar, mucilage, the muriate and sulphate of potassa and the acetic acid; for these chemists have discovered that the acid of milk which was regarded as of a peculiar kind, is

nothing but the acetic acid, modified by some animal matters and salts which it holds in solution; the other class only suspended, as cheese, butter and the phosphate of iron, lime and magnesia. Thus this first aliment of young animals, which we ought scientifically to regard as a compound of water, acetic acid, cheese, butter, sugar, extractive matter, the muriate of soda and of potassa, the sulphate of potassa, and the phosphate of lime and of magnesia, is made up of all the materials necessary for rapid growth. The cheesy matter is nearly the same as that of the muscles, the phosphate of iron is one of the constituents of the blood, and lime is the earthy basis and the element of hardness in the bones.

106. Milk then, generally speaking, is a sufficient nourishment for infants at the breast. M. Marcot in his letter to M. Brouyet, tells us that Monseigneur, the duke of Burgundy, whose physical education he superintended, took no nourishment but milk for a year. There may be cases which require departure from this rule. There are some infants whose peculiar constitutions require animal aliment as a valuable addition, others are benefitted by the creams of rice or bread well prepared. Rice is less liable to sour than the other grains which afford food for infants, and we know that milk is singularly apt to disagree with children about the fourth month of their age. Creams of rice with good broth are then very wholesome food. They constitute good nourishment, and at the same time an excellent remedial agent.

107. It is ordinarily about the seventh month, as I have remarked, (21) that the first eruption of the teeth takes place; it is therefore towards this time that every prophylactic means should be used to favour dentition and prevent the accidents which may interfere with this organic development.

108. The preservative means which relate to the nurses, are all those that can contribute to preserve the purity and good quality of their milk, or restore these when they have been lost. Mothers, who themselves perform the part of nurses, and women, to whom the easy parents entrust their children to be nourished, are all interested in providing for the wants of their infants, and few of them, when enlightened with regard to their duty, will determine to be careless about performing it.

109. As a woman advances in nursing she is more and more fatigued by the cares she is obliged to give to her infant, and her milk is more and more liable to be heated, to diminish in quantity, and to acquire acrimonious qualities. This last condition of the milk is too often the effect of bad regimen, and of ardent passions to which the nurses have yielded themselves; and it must be remedied by giving them good air, by relieving them of all cause of anxiety, or of chagrin, and separating them from every thing likely to excite lively emotions or tumultuous passions.

110. It is necessary to give them wholesome food, and chiefly such as is sweet and mucilaginous. Butchers' meat, poultry and the white meat of game, suit them very well. Sometimes they ought to prefer broth made of veal or chicken; the white meats of young animals. They can use with advantage the many kinds of pottage herbs, with sweet and little stimulating seasoning. They ought also to use farinaceous substances, in soups, creams, or otherwise. Their bread, well prepared, ought above all to be well fermented and cooked. Their meals should be moderate, they ought not to drink wine except when mingled largely with water, and they should abstain entirely from distilled liquors.

111. Some authors recommend to nurses, to take during the dentition of their children, some glasses of the infusion of fennel, anis, gluellin, or scorzonera, every morning. They say that these infusions not only give to the milk a proper tenuity, but that they are besides very proper to strengthen the stomachs of children, to hinder the coagulation of milk in the viscera, and to prevent colics and convulsions. The emulsion of sweet almonds, barley water sweetened with a little sugar, strawberry and raspberry water in summer, beer mingled with water; these are drinks which may be taken during the day. But it is important that they avoid all highly spiced, or highly seasoned food, made dishes, black meats, and such as are very viscous, as that of the hog, the goose, and the hare, because these aliments produce a thick milk which has not the qualities necessary for the teething child.

112. As to fruits, it is certain that those which are ripe may be taken in moderation without fear that they will be injurious to the infant. Good fruits contain much sweet mucous matter, capable of mingling with the milk and increasing its sweetness and its fluidity. It is true that fruits do not nourish much, nor augment

the quantity of milk ; but they refresh it and may assuage its acrimony, if it has but little.

This is not the case with sour fruits and those that are unripe. These cannot impart good qualities to the milk, and nurses should avoid them during the dentition of infants.

113. Nurses ought to take exercise only in moderation ; they ought not to perform any hard labour or undergo any fatigue, as those who live in the country are apt to do, especially, at certain seasons of the year, when females of the labouring class must work in the harvest field, attend silk worms, &c. Rude labour brings upon them other natural evacuations than that which exhales from the skin ; the appetite is impaired, the milk diminishes, and the heat of the body produces some change in it. It has been noticed that the milk is as readily heated by hard labour as by violent passion.

114. If nurses are sleepless some glasses of orgeat,* taken in the evening, may procure sleep, by tempering the heat of the blood and diminishing the force of the heart and arteries. This however will not always suffice. In this case they may take, at bed-time, a glass of the milk of sweet almonds with some of the decoction of lettuce leaves, or infusion of white poppy heads, sweetened with sugar or syrup.† The bowels should be attended to, and if constipation exists, purgatives must be administered ; especially if defective appetite, bad taste in the mouth, a white deposit on the tongue and teeth, wind, eructation, &c. announce that the primæ viæ are loaded with the products of incomplete digestion.

115. These means (109 to 114) ought to be sufficient to preserve to nurses the goodness of their milk, and they should at such times conform strictly to the instructions of science and the wants of the infant.

116. During dentition infants also should be under good regimen. Pure and temperate air is eminently salutary. If too warm it enfeebles them by provoking too abundant transpiration and exposing them to the effects of rarefaction of the blood ; if too cold it will cause fluxions and embarrassment in the glands of the mouth and neighbouring organs.

* A drink made of water, sugar and almonds.

† In taking narcotics it is always important to know the actual amount received. On this account we prefer laudanum to these uncertain preparations.

Trans.

117. Opinion is not settled with reference to the propriety of giving to children during the first dentition any other than the mother's or nurse's milk; we have seen above (106) that about the fourth month, which is precisely the time when the rising of the teeth commences, infants digest their milk with less comfort and perfection. The administrators of the hospital of Aix, observed that almost all their foundlings perished at four months and a half, and when they inquired the cause of the faculty of medicine of Paris, the committee who reported upon the subject, declared that the development and increase which takes place at this period is extremely critical.*

118. The observations I have made, apply rather to children raised together in hospitals than to those who have the advantage of domestic and individual care. If the infant manifests a sort of disgust for the breast, if its stools be green and glairy, if the epigastrium be habitually and partially swelled, etc. then it will be well to correct the milk of the nurse, either by reforming her own regimen, by giving her a greater quantity of animal food, or by giving the child itself a little broth &c. But if the milk digests well and the nurse has enough of it, there can be no doubt that it is the only proper aliment for the child during dentition. This nourishment, sweet and wholesome, and sufficient for their support, should nevertheless be given in less than the usual quantity, because the state of uneasiness in which they are at this time, deranges the powers of digestion a little, and a large quantity of aliment would render it still more imperfect. To obviate this inconvenience the nurse should give them the breast rather less frequently. Above all if she has not a great deal of milk she ought not to give it to the child at improper times. In thus properly nourishing the infant she will also render it useful aid.

119. Indeed the milk frequently moistening the mouth, refreshes this part which in dentition is inflamed, rendering nursing slower and more laborious. The milk, which of itself, is very soothing, by its contact with the gums, calms the pain, diminishes the tension, and prevents accidents, with which the infant is threatened. By its emollient quality this vegeto animal fluid has moreover the property of relaxing the tissue of the gums and of disposing them

* *Medecin Maternelle*, par Alp. Leroy, page 52.

to yield to the pressure of the teeth, which in this state divide them more easily than when they are dry and callous.

120. What I have advanced (116 to 119) brings me to recur to a truth which I have already announced (24); that is, that children should be suckled as long as possible. Reject if you please the doctrine of some, who think a child cannot be safely separated from the mother until it has sixteen teeth; for there are children who get their teeth more slowly than others. Children whose temperament is soft, and muco-phlegmatic would not be benefitted by protracted suckling. But in all other cases it is a wise practice to continue the nursing of young infants until dentition is well advanced, and experience shows that it is not likely to be difficult. How many evils, how many regrets, would be prevented by this course? Look at that burning mouth, that constant thirst, that violent disgust, that diarrhœa which threatens to become colliquative and which rapidly emaciates the most promising child; hear those cries of pain, mark that fever and that sleeplessness, and then if you can, withdraw from the little sufferer its proper food, before it has fairly cut its first sixteen teeth.

121. If during the course of dentition the milk of the nurse is sufficient for the child, it is very important that no bouillic (96) be given it. All the reasons mentioned in this chapter go to show that the period of dentition is not the time to venture upon such variations of regimen; but as prejudices are not easily eradicated, and as many nurses have not milk enough, and in this case it becomes necessary to seek some other aliment, nurses can have their choice of the following preparations.

122. The first is made of boiled bread, according to some, with the crumb of white bread, well dried and pulverized: according to others, with the crust, or better with the entire bread (crust and crumb,) well cooked, and pounded; chipped crust of bread or biscuits dried in the oven, and well powdered. This is cooked with milk to a semi liquid consistence. This wholesome food has none of the inconveniences of the bouillic of which farina is the basis. It is much lighter and more easily digested. Bread having undergone fermentation constitutes with milk a good and very proper aliment. The use which prudent observers have made of it with many infants, even in the pain of dentition, is a sure gua-

rantee that this preparation may be safely used to supply the deficiency of the mother's milk.

123. The second consists of a mixture of cow's milk and of an emulsion of sweet almonds. M. Spielman, who recommends this alimentary mixture, assured himself by various experiments that the emulsion of sweet almonds has a singular efficacy in destroying the tenacity which belongs to different parts of the cow's milk. On the faith of this celebrated Strasburg professor, practitioners have recommended this prepared milk to infants whose nurses have lost their milk and the success has been satisfactory. Cow's milk may be had everywhere and sweet almonds are abundant, so that the preparation may easily be procured. For the information of mothers, we will give the manner of preparing the emulsion and the mixture.

124. Take two ounces of sweet almonds, those in the shell are the best, because shelled almonds are more apt to be rancid and thus are likely to impart some acridity to the food; those which remain in the shell do not become rancid; sometimes they harden but that is of no consequence: take some of these almonds, shell them, and steep two ounces of them in hot water to take off the skin which envelopes them; bruise them in a mortar with a little sugar, until they are reduced to a paste; pour in by little and little a half pint of water continuing to beat the mixture till all the water is consumed. Then pass the liquor through a linen cloth and press the dregs that remain after the liquor has strained through. Take this expressed cake and beat it anew in the mortar, adding water as before, though in somewhat less quantity. Pass this through the linen as before. Mix all the milk of almonds thus obtained with one pound or pint of cow's milk, as M. Spielman advises. Put the mixture in a well stopped bottle, and from time to time during the day and night give some spoonsful to the infant, who will be as well pleased with this aliment as with the breast of the nurse.

As country people cannot always procure a mortar fit for this purpose they may make use of any clean wooden vessel, of sufficient size. This must be used for nothing else and be kept scrupulously neat.

125. Cow's milk mixed with the emulsion of sweet almonds (123) proposed to replace that in which certain nurses, especially

such as are feeble and delicate, may be deficient, constitutes a wholesome aliment, and moreover has the merit of being refreshing and sweet, qualities highly useful at a time when infants are heated by the pain of teething; it may also be used when the nurses have sufficient milk if the infant is voracious and exacts much nourishment. It is generally true that boys have a greater avidity and need of aliment than girls.

126. A third preparation (121) to serve as food for the infant is the following. Take a piece of bread, crust or crumb, and steep it in hot water; when well softened take it out and suffer it to drain. In the meantime have on the fire some broth, very hot; put the bread into it and stir the broth until the bread dissolves.

127. I will not speak again for the second time of the cream of rice, (106), which may be made of the whole rice or the rice flour, flavoured with some drops of orange flower water, aniseed, fennel, or cinnamon. These creams have their use, and can be prepared in various ways. M. Professor Alphonso Le Roy, has advised soups and broths with the roasted grains of barley, to which is added a small quantity of brandy, or broth, with wheat flour dried in an oven until it becomes of a yellowish hue.

128. I must not forget to mention that children who take other aliment than milk desire drink often. It is useful to teach them early to drink; that which suits them best is water sweetened with sugar.

129. All the nutritive preparations that we have mentioned to supply the want of the nurse's milk, do not render it unnecessary to use means to restore or increase this secretion. It is generally in old nurses, and especially in such as are thin, and whose fibre is dry, that the milk is deficient. The use of succulent meats and farinaceous aliments on which such persons ought to live, will contribute to the augmentation of this important secretion. M. David, surgeon at Rouen, has advised to make frequent use of the infusion of the elder flowers. This infusion drank warm, sweetened with sugar, and taken from time to time, has sometimes promptly re-established the secretion of the milk. Bergius recommends with the same intention, a remedy which according to him, has had great success. It is a decoction made with three ounces of the sweet fennel root, an ounce and a half of anis flowers, and of chervil, with a quart of water, which the nurse must take every

day until she perceives a marked change in the secretion of the milk; an effect, which according to the Stockholm professor, will speedily result.

130. In the different details that I have given to mark out the best line of conduct for the good of nursing infants, and to preserve them from the evils which ordinarily appear during dentition. I have had in view, principally, children raised by nurses, with woman's milk, and with some other nourishment as accessory to it. There is an unnatural way of raising children, known as artificial suckling, in which the woman's milk is not used at all, but the infant is supplied altogether with the milk of the goat or cow. This is given warm, by the aid of a bottle and a tube of various shapes, called teterole or biberon. Proscribing bottles of this kind, some have preferred a simple spoon of medium size, made of shell, ivory, or wood.

131. Artificial suckling is a practice to which we are forced to resort for foundlings. It is very precarious and very inconvenient, but sometimes it is successful. To make it succeed, much care, extreme vigilance and great judgment is necessary. The constitution of the child must be good, and the animal which supplies the milk should be constantly watched, that we may see that its food is suitable and its health taken care of. Goats which browse along the hedges and eat the tops of the thorns and the leaves of the brambles, give to their milk a quality which sometimes occasions in the child an eruptive disease frightful to look upon.

132. In considering these attentions (130) which in the artificial suckling are even more important than in the natural mode, the same rules of conduct should be observed for infants of the earliest age, both as regards the employment of milk and of the accessory aliments. Van Helment has ventured to say that milk is more injurious than useful to the child; he has proposed to raise it without the breast and has set an example; but Van Helment ought not be imitated and is not imitated.

133. Nurses ought to lull the children to sleep as often as possible during dentition, because this state facilitates digestion and repairs the strength by permitting a regular distribution of the nutritive juices. The quiet which accompanies sleep is of happy presage, and while the body enjoys this, accidents are not likely

to manifest themselves. It is necessary then to employ every means to lull the infant, by darkening the chamber, preserving quiet and silence round the child, by rocking it softly, and perhaps by administering some remedy prescribed by a physician.

134. Diarrhœa being an accident which very commonly complicates dentition, every attention must be given to preserve children from it, because of the sorrowful consequences which sometimes result. To prevent it, it is necessary to evacuate the acrid matters which may be lodged in the intestines, the retention of which is a common cause of diarrhœa.

As it is not easy to make infants take all kinds of purgatives there is some advantage in using an infusion of a drachm of rhubarb in a half pint of water, sweetened with sugar to the consistence of a syrup, this is given in doses of a tea-spoonful, repeated frequently, until it produces the desired effect. The infusion of a drachm of senna in the juice of prunes sweetened with sugar and given in the same way succeeds equally well. Such purgatives are preferable to manna, which weighs upon the stomach, creates wind and often does not purge. These medicaments are simple, handy, and easily administered. Rhubarb, as is well known, purges pleasantly and strengthens the intestines; its use disposes the digestive organs to perform their functions. If professional men who have charge of infants during dentition, should think these preparations insufficient, they can make use of others, such as the syrup of rhubarb, &c. Syrups agree well with infants.

135. If the bowels of the child are distended and tymparitic, and if there is constipation, the use of injections is particularly indicated. These are preferable to the suppositories which nurses are in the habit of using without considering that these topical applications are apt to excite useless straining; they are incapable of preparing and expelling the matters contained in the great intestines, the hardness and retention of which is the immediate cause of the tension of the belly, the colic, and other morbid affections which injections might prevent.

136. Painful distention of the bowels may also be obviated by frictions with warm olive oil or camphor; by covering this region with flannel steeped in a decoction of emollient and carminative plants, such as the chamomile, the elder, mallows, &c. Some practitioners recommend the internal use of the oil of sweet

almonds; this oil is more efficacious if mixed with a little castor oil. Care must be taken to keep the feet warm, and sometimes it may be well to apply to the soles of them a plaster of galbanum mixed with some camphor and opium.

137. The attentions which should be given to children during dentition, ought not to be limited to such as we have mentioned. There are others which refer to the state of the mouth, and which must never be neglected. Dentition is undoubtedly the work of nature, and in many cases it should be left to her care; nevertheless art may aid her in effecting this process. The teeth must pass through the gums, and it is reasonable to suppose that their tissue is very often too dense and hard owing to their pathological condition. It is for art to devise means to soften them; and these are found in those applications which possess the property of relaxing the fibre. Nature, at this time, seems to indicate the necessity of these means, by the abundance of saliva which she makes to flow into the mouth, so as to keep the gums constantly wet. The saliva effectually softens the fibres of those parts and disposes them to yield to the efforts of the teeth to divide them; but this natural means may be insufficient, and with a view to supply its place and increase its quantity, we have recourse to frictions made frequently and lightly upon the gums with fat, mucous or emollient substances. Some recommend the grease of the capon or pullet, very fresh hog's lard, fresh butter, cocoa butter, &c. The brains of hares is much in vogue for this purpose among the higher class of society; it is not more emollient than the other animal substances we have mentioned, and is not so easily diffused over the gums.

138. Mucilages of flaxseed or of gum arabic sweetened with honey are also used with advantage. The sweet taste of these compounds is agreeable to children, and they readily permit the gums to be rubbed with them, which they will not always do when less pleasant applications are used. This mucilage can be applied with the finger, or with a little stick of liquorice, or of the root of the mallows, which the children will bite with all their strength. The slight friction made by the tip of the finger so far from displeasing, seems to gratify the child by appeasing the itching sensation which annoys it.

139. The practice of rubbing the gums with the finger is recommended by authors and is justified by experience. Nils Rosen, in his precepts upon the diseases of children, published in Stockholm, in 1768, advises it formally and regards it as a means of avoiding the evils which attend dentition: if it be neglected, says this celebrated physician, the parts must be anointed with honey, syrup of violets, mallows, or some mucilaginous and oily substance. It is also well to give the child a piece of dried mallow root to bite upon.

140. On the other hand M. Auzeby, surgeon dentist, has published a special work against this practice, (139) in which he charges it with hardening the gums and rendering them callous instead of inclining them to be readily divided; besides inducing an irregular denture by causing the teeth which shoot from beneath, and which cannot traverse the gums directly in their passage from the alveoli, to throw themselves to the side which offers the least resistance, and thus deviate from the right line. But can so slight a cause produce such effects? Can the finger, which pleasantly rubs the gums, and soothes the unpleasant sensation which teases the child, be the cause of so great inconveniences? If we examine the objections of the French dentist, we will soon perceive that the irregularity of which he speaks proceeds from causes very different from that to which he attributes it, viz: to a plurality of germs in a single alveolus, irregularity in the elevation of the borders of some alveolar cavity, from the pushing forward of a permanent tooth, while the milk tooth is yet firm in the gum, &c.

141. It is easy to justify the preference which is generally given to substances capable of compressing the gums softly, to those which are hard and altogether unyielding. It is a fact that teething children carry to the mouth every thing which they can seize, and when they have nothing else, they put into it their fingers or their whole hand.

I have already said, (138) that a piece of liquorice or mallow root, suitably prepared and steeped in a little honey, syrup, or mucilage, is very useful. A piece of small bougie, steeped in sugared water, figs cooked in milk, or pressed between the fingers, serve the same purpose. These means, considered as instruments of soft pressure, or as mucilaginous and sugared bodies do good to

the children, and they appear to take much pleasure in pressing them between the gums and sucking them.

142. The coral, the toy so agreeable to children on account of the little appendages which are generally attached to it, is an instrument which nurses usually put early into the hands of the infant to facilitate the cutting of its first teeth.

This instrument has its advocates and its opponents. M. M. Andry, Desessarts, Rosen, Delearye, and some others have declared in its favour; M. M. Levret, Auzéby, Hebert, Moser, and others deny its utility. The important thing according to them is to seize the proper moment for its use. The infants, tormented with the itching of the gums, as soon as dentition begins, constantly carry to their mouths and press with their gums every thing that is placed in their hands. If the coral be given to them too soon, they bite it unceasingly and press their gums strongly against the hard body: hence this instrument whether it be of crystal, ivory, or any thing else, must harden the gums, render them callous, and cause them to resist more firmly the progress of the teeth. The relaxing means, (138) in the early period of dentition, are altogether preferable to dispose these parts to yield to the bodies that divide them. But when the teeth, more advanced in their development, have sufficiently thinned the gums, and when they are so well formed that with a little tact, we can distinguish them by the sight and touch, then the use of the coral may be proper. Infants at this period press it with more force than in the earlier stages, because the sensation to be relieved is more urgent: the gums thinned and much distended, being thus more directly pressed between the two hard bodies; they yield readily to this double action; the teeth appear; all the indications are fulfilled.

143. I have glanced at (74 to 142), the principal errors which may be committed in the manner of raising infants; and I have insisted upon all the points of their hygiene which can influence dentition and render its development more sure and more easy. The preservative method always has a great advantage over curative treatment. The one prevents suffering; the other combats the causes of it; the one retains the body in health while it passes through its development; the other re-establishes it when the disorders are not too many, nor too severe. Preservation is more sure and always agreeable; the process of cure is hazardous, and generally attended with much unpleasantness.

CHAPTER III.

Of Constitutional Vices and Maladies which more or less directly impede Dentition.

144. The cutting of teeth is performed under the influence of great mobility, (36 to 73), and to this is often superadded the effects of errors in physical education (74 143;) but these circumstances are not great morbidic dispositions, or causes whose effects break forth sooner or later at the time of dentition. But there are physical vices which are already diseases; there are disorders more or less advanced, which of themselves exercise a dangerous power over the teeth, their organization, and their eruption. Such disorders, influencing the system at large, and threatening its organization, or actually attacking the texture of some parts of the body, arrest the development of its organs, and render it imperfect, and so to speak, monstrous. Dentition is doubtless an occasion in which all the errors of the economy manifest themselves, with intensity differing in different individuals; but dentition is not the cause of them. It is but the flame kindled by a covered fire which has long glowed unobserved.

145. I place in the rank of the maladies of which I have just spoken, (144) debility or radical feebleness of the constitution; *polychmie*, or the exuberance of juices, mesenteric *physconic*, or engorgement and obstruction of the mesentery: *rachitisme* or the disposition to rickets, and even rickets itself; and finally an unnatural state of the alveoli and gums.

According to the design of this work I need not discuss thoroughly the various maladies I have just mentioned; but I will show how they interfere with dentition, and how their influence may be checked and neutralized.

ARTICLE I.

Of Debility and Radical Feebleness of the Constitution.

146. Feebleness of the muscular movements constitutes the character of debility (*asthenie*) and in this disease the impairment of the intellectual faculties is only a consequence. When debility

is well marked, there exists so much languour in the exercise of the functions, and in all the acts of the organization that the development of parts which always requires a certain amount of active force, is slow, irregular, confused, and often abortive and incomplete. This radical debility is sometimes concealed under the appearance of a good complexion. The children appear fat enough, but their flesh is soft, their eyes want vivacity, their cries are feeble, they sleep much and are altogether apathetic, even with regard to the breast for which they shew little avidity.

147. Feeble children are generally the offspring of parents of bad constitution, of mothers who suffer with leucorrhœa, or of women whose pregnancy has been a course of errors and sufferings. I have observed that women of blonde appearance, and very white skin, those who menstruate abundantly, and are subject to miscarriages, are apt to bear children, radically feeble, whatever may be their appearance of health and physical strength. The greatest number of foundlings are of this class. Again these that come into the world afflicted with a syphilitic disorder, or a scorbutic affection, are generally debilitated, and in this point of view incur all the dangers which attend this morbid affection.

148. An extremely sorrowful effect of feebleness of the constitution is deep seated cachexy. This manifests itself by different species of dropsy. Some come into the world with hydrocele; others are born with hydrocephalus; all are extremely subject to acid indigestion, and to the development of acridities in the primæ viæ which deprave the digestive functions.

149. Women of very delicate temperament, dyspeptic, infirm and nervous, who live upon tea, chocolate, coffee and milk; who take little exercise; who are the slaves of their passions; who take advantage of their pregnancies to give themselves up to fanciful appetites, these have feeble children; in fact the debility is transmitted from the parent to her child.

The soft constitution of the children which results from this becomes complicated with an excess of sensibility, and there results a sort of laxity which has been ingeniously termed *vibratile*, and which exposes the children to all the maladies dependent upon the relaxation of the fibre and the acrimony of the humours. When the soft cachexy predominates, there results clammy swellings; when on the other hand the cachexy is acrimonious

there is a shining puffiness ; in each case the organic developments are so powerfully counteracted that they can only progress with pain and disorder, amidst which life is often destroyed.

150. It is with the soft cachexy that lymphatic effusions are common. Those which take place in the cellular tissue of parts belong to anasarca : and hydrocephalus externus, which is constituted by the collection of water between the bones of the skull and the integuments depends upon this in an obvious manner. The hydrocephalus internus, a morbid affection of the arachnoid, the serous membrane enveloping the brain, is of another kind ; it is acute or chronic. The first appears to depend upon erysipelatous or at least erythymatic inflammation, or a powerfully spasmodic affection of the arachnoid ; the other, though often a consequence of acute hydrocephalus, seems to belong more particularly to the atony of the cerebro lymphatic system, and to be united with the debility, hereditary or acquired, of very young children.

151. Hydrocephalus internus is one of the maladies to which practitioners have paid but little attention, and which nevertheless, connects itself in a very fatal way with dentition. Some observations of my own have convinced me that acute hydrocephalus is more particularly the effect of dentition, and that chronic hydrocephalus, is that which, previous to this organic operation, complicates it dangerously, arrests it, or modifies its nature : one proof which I may allege in proof of this assertion is that according to Dr. Whytt, hydrocephalus requires some months to form in, and that when circumstances begin to aggravate it, it requires some weeks to destroy the child ; while according to Dr. Fothergill, children which to all appearance enjoy excellent health, are seized suddenly with this malady, and die of it about the fourteenth day ; this observer never having been able to trace the disease back to a commencement anterior to three weeks.

152. The glossy cachexy is more favourable to the production of scorbutic affections, this pathological condition does not interfere directly with dentition : some facts go to show that it renders it more precocious, though difficult. It is in the midst of scorbutic phenomena that are formed the double rows of teeth of which I have already spoken. (12) The children were feeble, their mouth was very offensive, their gums were apt to bleed and even in a

state of suppuration, their skin exhibited a number of purple patches; their mothers were poor and their nourishment bad.

In the observations recorded in paragraph 15, we have noticed that it is in a scorbutic habit that the crust is formed which envelopes several teeth and gives them the deceptive appearance of actual union. The scorbutic gangrene of the mouth of infants, described in the memoirs of the Royal Academy of Surgery, has a destructive action upon the teeth: those children who are not destroyed by it, have a dentition irregular and accompanied with accidents. It would indeed be very extraordinary if in a scorbutic affection remarkable for an acrimonious degeneration of the animal humours and great debility, dentition should progress in an orderly and natural manner.

153. When a child has suffered long or much from hunger and cold: when it has nursed badly and been badly nourished, when it has been subject to diarrhœa and to very violent colics, it is much enfeebled, it is meagre and pale; its skin is wrinkled, and more or less yellow, it presents even various spots, erysipelatous patches, livid places, &c. and these symptoms of debility may be mistaken for symptoms of syphilitic disorder, as this last is a great cause of debilitated constitution. In order to make no mistake about the existence of this disease. it is necessary to make a minute examination of the lips and principally of the commissures, upon which chancres may be found; of the tongue and inside of the cheeks where aphthæ may be discovered. It is also necessary to examine the face, the genital organs, the buttocks, where syphilitic buttons and ulcerations may appear: it becomes necessary then to weigh the importance of the different symptoms we may have discovered, which attest that the child is deeply infected with a disorder which has been transmitted from the parents, or communicated by the nurse.

154. The different causes of debility of which I have just spoken (146 to 153) interfere so powerfully with dentition, that they demand the employment of all possible means of relief. If this debility depends upon the bad health of the father or mother, we must strengthen the child by giving it good milk, animal juices, soup of boiled meat, &c. we must also give it fresh air, and expose it carefully to the rays of the sun: for insolation is of great advantage to debilitated infants, not only through the calorific but also

the luminous rays. Among the internal remedies proper for such cases, we may mention the alcoholic tinctures and above all phosphorated ether. This last remedy merits the greatest attention from practitioners.

155. In this state of general debility two principal circumstances are worthy of note. The first is the formation of acids; the second is a marked tendency to some kind of dropsy. Acids easily form in the stomachs of very young infants. They are the result of imperfect digestion, and tend to vitiate it still more; being contained in the first passages they thicken the mucous and albuminous fluids which are found there. These concrete and appearing in little clots in the midst of glairy mucus and other crude matters, pass in the opinion of the nurses for the germs of the teeth. In the second passages, the acids vitiate the blood whose consistence and principal qualities they change. It becomes too mucous and its phosphoric salts are so dissolved and changed that they do not deposite themselves readily, or perhaps, not at all, in the osseous structures. This is the reason that dentition does not advance; that ossification is suspended or extremely slow, and that the children suffer pain; for the acids injure the nerves and exasperate their sensibility.

156. Absorbents are the true remedies in these cases of acid from indigestion. They are however, more useful when combined with tonics. When the children smell sour; when their dejections mingled with a great deal of mucus, are green or speedily become so, when the bowels are swollen and puffy, the visage pale and swollen, especially when the pallor extends to the lips and caruncule lacrymales; when the weakness of the little sufferers contrasts remarkably with their avidity for the breast, showing the presence of an acid irritating the nerves of the stomach; in such cases absorbent and tonic remedies are useful and bring prompt relief. A combination of magnesia with cinnamon and iron forms an excellent remedy. A solution of the carb. of potash in water, with the addition of the infusion or tinct. of cinnamon produces good effects. A little lye made with the ashes of vines with a little wine forms a remedy accessible by the poorer class. In this condition, when there is diarrhœa, chalk water is not an unimportant remedy. As there is great sensibility in the first passages, good use may be made of the creams of

salep prepared with rich soup. If the case requires a remedy strongly absorbent and somewhat soothing, the anodyne coral powder of Helvetius may be used. The powder of *'guttete'* with musk or camphor is a very good absorbent and antispasmodic.

157. It is singular that in some cases we cannot succeed in removing the acid from the child, except by changing the regimen of the nurse, and causing her to take absorbent and tonic remedies. It is a good plan to make the nurse live chiefly upon animal aliment; to give her regularly, once or twice a day, one of the usual powders; magnesia, or some other alkali, with the addition of rhubarb, quinine or columbo. These means act singularly upon the infant; for it is known that for the most part their digestion is too rapid to be well performed. The aliment upon which they are sustained has a tendency to the acid fermentation. For these two reasons it is not sufficiently animalized in the *primæ viæ*. Thus we find in almost all their diseases, evidences of superabundant acid given out by their respiration, their digestion, &c. This truth is confirmed by the experience of M. Briende, and of all others whose attention has been directed to the physiological and pathological condition of infants.

158. The hydrocephalus debility (150, 151) is fraught with more serious results. This has almost nothing to do with hydrocephalus externus, which is only an œdema of the integuments of the head. The signs of this are too manifest to be mistaken. The observer sees a watery tumour of the head, which sometimes becomes monstrous and very heavy. It has all the characteristics of a lymphatic tumour. The cure consists, 1st in the gradual evacuation of the effused liquid by means of a seton in the neck. 2d, The application of topical tonics, such as chalk water mixed with brandy, or the vulnerary water of camphor. 3d The internal use of some tonics. Children bear spirituous preparations well, and the tinctures of quinine, cassia lignea, cardamum and cinnamon, are suitable for them.

159. But when hydrocephalus is internal, the water of the ventricles of the brain compresses that organ; the sutures of the skull are opened, the head has a species of translucency when placed between the eye of the observer and a candle; the children are pale, feeble, languid, even stupid; they cannot carry the head straight, the eruption of their teeth is slow and painful, and, as

Lieutand has observed, their eyes are prominent; the pupil is dilated and they become blind. Sometimes too, they become deaf, and occasionally there forms the aqueous tumour of the spine, which has received the name of spina bifida (hydrorachitis;) finally they fall into profound coma.

160. Whytt, who has devoted himself to the study of chronic hydrocephalus internus, (150, 151,) has divided its history into three periods. In the first there is loss of appetite, and aversion or at least indifference to the ordinary food—paleness, and loss of flesh. The pulse is frequent and perfectly regular; the child vomits several times in the course of the day, or perhaps only once in two days. These last symptoms are regarded as very important. We find also in this first stage of the disease, irregular exacerbations of fever, change of appearance, whiteness of the tongue and constipation sometimes alternated with purging. The children rub their nose, grind their teeth, are pained by the light of the sun or of a candle, and although more disposed to wakefulness than sleep, they rest willingly either abed or in the arms of their nurses.

161. In the second period these symptoms augment in intensity; there is added to them, great debility, the skin is warm; the eyes, which the infant rubs frequently, are red; they are subject to sudden terror and utter piercing screams; convulsions, at least of the face and eyes mingle with the cries; the pulse takes on a peculiar character; it is slow, and irregular and unequal both as to the force and the interval of the pulsations, while the heat of the body continues as high or higher than usual, and even appears to bear an inverse proportion to the frequency of the pulse. Indeed when it becomes more frequent the irregularity diminishes, and when very frequent it is more equal and more regular.

162. Such is the character of the pulse which is peculiar to the third stage of hydrocephalus internus. Then the sleep is profound; there is even stupor and a commencement of paralysis about the eyelids. The pupil is very much dilated and ceases to contract. The fatal symptoms, such as the subsultus tendinum and other convulsive movements, the agitations of the night mare, the livid redness of the tongue, hæmorrhage from the nose, paralysis of the muscles of deglutition, &c. now come on. Finally respiration becomes hurried and painful, and a long interval of

suspense after each inspiration announces that life is about to be extinguished in the midst of convulsions.

163. Such a disease cannot but be extremely dangerous. It is curable nevertheless : I have stated a case of cure of true hydrocephalus in my treatise on the convulsions of infancy. We oppose the disorder with blisters, and these are of great utility ; dry or aromatic frictions over the whole body ; tonic applications to the head ; and nervine liniments along the sutures of the skull. Diuretics and purgatives are useful means. Among these we may mention a lye of the ashes of the broom, or an infusion of the inner bark of the elder tree in white wine or brandy. Mercury has been proposed with confidence by many observers, and it should not be overlooked, for it possesses the quality of exciting the absorbent system and reanimating its suspended functions.

A decoction of the root of the madder or gentian, or quinine might be usefully employed during convalescence.

164. The scorbutic debility may properly be suspected in feeble infants which are born of mothers afflicted with some kind of scurvy, which are born in damp localities, or which are placed in unhealthy hospitals. These infants have a swelled face and are of a pale yellowish colour. In feeling their bodies we find here and there little hard places like ganglions ; their gums are of a soft tissue, and finally they exhibit lenticular, yellowish or livid spots. Those who are old enough to stand alone, or to walk, show the utmost indolence ; they love to lie down, and in making them stand, their knee joints bend and they fall. The disease progresses and their gums become swollen, liable to bleed, and fetid, as in the case of adults. This condition requires medicated milk. This is procured by making the nurse to eat much vegetable food, and in administering to her the juices of antiscorbutic plants, or the antiscorbutic syrup or medicated wine. If the child lives upon goat's milk, the animal should be fed upon cabbage, turnips and fresh grass. The extracts of bitter plants are useful to the child, and that of the sarsaparilla as a depurative diaphoretic is very useful. For such infants the open air is absolutely necessary. They cannot be cured unless they are frequently taken out of the cradle and the chamber, and exposed to the light and fresh air.

165. The syphilitic malady (147, 153,) in infants, merits much attention from the physician, both on its own account and because

it is likely to render teething painful and dangerous, by vitiating the fluids and by disposing the constitution to rickets, the bad effects of which upon dentition we will have occasion to notice. The result of observation upon this disease is sorrowful indeed. Many children die from it in the first month of their life; some from the immediate effects of disease, others from inability to nurse, owing to great debility, or to the difficulty and pain of swallowing when the mouth is covered with chancres or aphthæ. Among those who escape this epoch there are a great number who die either from the complications it forms in its course or from the disorders of dentition. The rest grow with great difficulty; and second dentition, scrofula, rickets and obstruction destroy a great part of them. Finally those who escape all these causes of destruction have a tottering constitution; and puberty or phthisis carries them off. Few survive till manhood, and it is doubtful if any have arrived at old age.

166. Among infants that inherit syphilis it is important to distinguish the cases in which that disease develops itself immediately after birth, by its ordinary symptoms, from those by which it permits for some time the appearance of health. The first come into the world covered with pustules which sometimes are so numerous as to fill the spectator with horror. This state of the skin, and the knowledge of the diseased condition of the parents, make the diagnosis plain. It is not so easy to detect it in the other case, because the infants appear to be healthy and fat, and their condition does not change until after the first or the second week; sometimes not until a month or six weeks. This is apt to occur in cases where the mother has during pregnancy, undergone a partial treatment of the disease.

167. These children are not slow to lose the health which they appear to enjoy; they become restless and suffer without apparent cause. Their legs are feeble, their colour is pale and leaden, and they do not relish their milk. The parts first attacked, or at least most severely, are the eyelids. They discharge at intervals, and especially in the mornings, a purulent matter much like that of blennorrhagia. Painful fissures in the skin appear about the folds of the buttocks or the groin. Excoriation of the penis sometimes take place. Abandoning its ordinary course the disease fixes itself upon the lips and produces at the commissures the same

sort of suppuration as in the eyebrows. This suppuration becoming more consistent, and changing its appearance to a black crust causes aphthæ of a very bad character to spread in the mouth. The arms, the spine, the genital parts, the buttocks, the inside of the thighs, in fact the whole body becomes covered with pustules discharging a thin and fetid matter. Lymphatic embarrassments occur and the glands of the lower jaw and of the neck swell up and harden. Emaciation comes on rapidly, and it is not rare for fatal gangrene to finish the scene.

168. Thus syphilis has, in new born infants, a peculiar character and progress. It may be confounded with the effects of bad management, or with a peculiar kind of aphthæ called muguet. In the first case the sound condition of the nurse's breast, her carelessness of her infant, the neglect of cleanliness and bathing, will throw light upon the cause and nature of these symptoms. In the second the diagnosis is more difficult, when as sometimes happens, aphthæ resembles syphilis in its effects upon the lips, mouth or fundament, and in the contagious manner in which it spreads from the little sores it makes around the breast of the nurse. Nevertheless if one be well instructed in the signs which characterize syphilis when mercury has not been taken, he will not confound muguet with it. These symptoms are very remarkable. There are flat and livid pustules on the skin and genital parts; excrescences upon the anus and sexual organs: phlyctenæ, chancres upon the interior of the great external labiæ, of the fourchette, of the margin of the anus, of the tongue, of the velum palati, and of the lips; ulcers of the navel, of the head, of the axillæ, pustular ulcers of the glands, purulent ophthalmia coryza with purulent discharge, carious ulcers of the bones, suppurating ulcers on the fingers and the hands, and finally, blindness.

These, the most certain signs of syphilis in infants, are confirmed, when pustules or ulcers are communicated by them to the breast of their nurses.

169. In the treatment of syphilis in the new born infant, we cannot expect success, unless the child be fed upon nourishing aliment, and that which is easy of digestion, and be permitted to breathe pure and fresh air. If its nurse have sufficient milk it will not be necessary to give it any additional nourishment except a little rich soup, or any medicine except such as it may receive

through her. If on the contrary she should have but little milk, it will be necessary to treat the child more directly, and to enforce upon it a proper regimen, which will differ according to its age and the extent of the disease. Pure milk, the sweetened cream of bread, milk soup, rich soup, wine and water; these are the aliments to be given, under proper restrictions.

170. Mercury is the remedy which most directly cures the syphilitic disorder. It may be administered to the infant, or to the nurse, or to both at the same time. The treatment of the nurse has nothing very particular in it. Baths and a purgative are the preliminary means, and frictions with mercurial ointment, or the internal use of the corrosive sublimate, are the curative remedies. This latter preparation of mercury is perhaps preferable to any other when the syphilitic disease is inveterate, and it may be advantageously combined with sodorifics.

As to the infant, we may use either mercurial frictions, or the internal use of calomel or corrosive sublimate, as we may prefer. The latter is more sure. But whatever means be made use of, we must not forget that salivation is very rare in young infants, and that as the mercury tends to develop its effects upon the intestinal canal, there may result from it severe colics and violent pains. In order to provide against such accidents it is necessary to administer the mercury in very small doses, but it must be persevered in for a long time. In the milder cases, a cure may not be effected for two months and a half or three months, and a month longer will be required for the removal of the more serious forms of the disorder. Six weeks of the direct use of mercury may be sufficient for those who are suckled by nurses who are made to undergo anti-syphilitic treatment.* During dentition the mercurial course must be suspended.

171. It remains for me to point out the effects of a scrofulous constitution, and of scrofula itself, upon dentition. But to avoid

* *Frictions*—Five or six grains of ointment may be rubbed upon the infant every three days. *Calomel*; a half grain may be given in a day, divided into three doses. A combination of the following kind is sometimes used. One grain cal. twelve grains of rhubarb and twenty-four grains of sugar, to be taken in six doses. *Corrosive Sublimate*—A twenty-fourth part of a grain, in the course of a day may be given to a child under six months of age; to one older a twentieth, which may be increased to a twelfth. To be taken in divided doses.

useless repetition I refer the reader to my treatise on scrofula; second edition, page 43. It is sufficient to remark here, that dentition in general is a dangerous epoch for scrofulous children. It is tedious and liable to accidents. The treatment is confined to the means proper for combatting mucous debility and the rickety constitution.

ARTICLE II.

Of Polychymia or the Exuberance of Fluids.

172. The abundance of fluids of good quality constitutes polychymia, and upon this depends hyperæmia, or sanguineous plethora, or lymphatic plethora; and the unnatural development of an organ or tissue through exuberance of fluids belongs to this article, because these conditions exert a pernicious influence upon dentition.

173. If experience had not established the fact, reason and reflection would teach us that hyperæmia must impede dentition. This process is a cause of agitation throughout the whole body, and the blood seems to be formed in larger quantity at this than at other times. It distends the arteries; and post mortem examinations of children who have died during this period, shows the bones to be red from injection and even soft. The brain contains more blood than usual in its sinuses and the vessels of its base; all the capillaries are engorged, and if we inject these little subjects, the injection passes to the head in such quantity that the face becomes almost black. The reason of this hyperaimic condition is obvious. The body grows rapidly, and the blood, the common source of all the constituent fluids, must be augmented, proportionably, to furnish materials for nature, occupied in repairing, perfecting, and enlarging the organism.

174. But the blood, so necessary while it retains its proper proportion to the demands of the system, is injurious, and conveys disorder every where, when it exists in too great quantity. Hence it has been observed that the economy, at the time of dentition, whether abounding in nutritive fluids, or weakened by their insufficiency, or disordered by their vitiation, is equally liable to suffer: children, too robust, too feeble, or constitutionally depraved, are all likely to be victims to the accidents of dentition. The

good quality of the fluids depends upon their perfect mixture and the just proportion of the parts that compose them. Hence when we see that hyperæmia increases the causes that disorder dentition, we have a confirmation of a truth, so often declared in this work, that this development is of no consequence when the acts of the whole economy are in harmony with it; but of the greatest consequence when it is otherwise. We must consider dentition, as M. Alph. Le Roy has well said, as only a special subdivision of a general action; hence dentition is but an effect which requires us to go back to a general cause: our little success in curing, generally results from our confounding cause and effect; directing our attention to the latter, we waste our strength in vain, because we attack symptoms and not causes.

175. Hyperæmia may properly be regarded as a disposition of the body which authorizes us to fear that dentition may be attended with serious consequences. M. Moser has specially dwelt upon this point; and Hippocrates has remarked that persons who are most robust run great risks, since they cannot remain long in the same condition, and having nothing better to expect they must change for the worse. This remark appears a sensible one, when we consider the number of causes constantly at work to embroil the various parts of our complicated organization. The author of the Hippocratic book "de dentitione," has stated that plethoric children are more exposed than others to the evils of dentition.

176. Such assertions are supported by the authority of many observers who have noted and explained the general bad effects of hyperæmia. Lieutaud speaking of the disorders which it may provoke, enumerates vertigo, convulsions, apoplexy, cephalalgia, and obstinate ophthalmia, fever, inflammatory engorgements, hæmoptysis, suffocative catarrhs, and many other maladies. According to M. Tissot, when plethora exists, it is the brain and not the nerves, which suffer injury. The engorgement of the cortical substance necessarily affects the medullary of which the nerves are only the continuation. Pressure produces its effects; inequality of pressure is manifested by its own symptoms; irritation of the sensorium commune has its peculiar mode of manifestation. Thus from disorder in the distribution, and in the determination of the blood, results all the maladies of the head and nerves.

Their functions, says Boerhaave, may be hindered, or disturbed, or augmented in activity; hence will arise all the affections of the mind, vivid sensations, incoherence, madness, convulsions, palsy, stupor, apoplexy, and death.

177. Is it strange that when dentition sets in motion a mass of blood disproportioned to the wants of organs, the brain should be engorged, the gums swollen and inflamed, and such a condition incurred as may well alarm us for the safety of the child? But it may be proper to remark, that the accidents of dentition so far as they are dependent upon hyperæmia, do not result from the influence that the brain exercises over the whole body, but the irritation which has its seat in the jaws, occasions engorgement in the brain, owing to its soft and vascular structure and particularly because of its great relative development in infancy. The great number of diseases incident to childhood shows perfectly that the predominant influence of the brain is of no consequence, since these maladies are principally originated in the bowels or some part of the digestive apparatus.

178. A physiological condition connected with the local hyperæmia of the head and the constitutional development of the brain, is the disproportionate size of the head. Children born with such constitutions, or whose heads grow very considerably, are disposed to difficult dentition and convulsions. Such is the opinion of Moriceau, Levret, and Dessarts. The cerebral mass has been considered the measure of animalization; but when it is disproportioned to the natural size of the animal, it indicates an aberration from the laws of nature and every departure of this kind may easily slide into disease.

179. Another circumstance, which cannot properly be disconnected from hyperæmia, is the animal heat. The caloric of the system has a close affinity for the blood: it increases with augmentation of this fluid. What indeed are the symptoms of hyperæmia? The colour of the cheeks is florid, the appearance ruddy and animated, the eyes prominent and brilliant, the neck apparently swollen, the respiration quick, the head, loins, and indeed the whole body hot, the belly constipated, and the urine commonly cloudy and high coloured.

180. When these symptoms occur we ought to combat them indirectly by regulating the diet of the child, by dispensing with

the use of the swaddle, which by its compression may aggravate the effects of plethora; by extreme neatness and by light clothing. The child should be bathed frequently in soft, tepid water; its bowels should be relaxed, either by emollient injections or by the use of mild laxatives.

181. The direct treatment of hypercæmia consists in bleeding by means of leeches applied to the temples or the margin of the anus. One or too may be applied according to the age of the infant; a greater number would be imprudent. The loss of blood relieves the brain, and even remedies diarrhœa, where it exists, by removing the cause of it.

Independently of the effects of depletion, leeches are doubtless serviceable on account of the counter irritation caused by their bites.

The material cause of disorder in the cases under consideration, is either the abundance, the irregularity of distribution or the congestion of the blood, in an organ naturally soft and easy of compression. Bleeding, by means of one or more leeches, acts particularly upon the cause; it is only necessary that the quantity of blood abstracted be proportioned to the necessity of the case.

182. The effects of hypercæmia have been judiciously estimated but those of lymphatic plethora have scarcely been suspected. The blood fills the red, while lymph occupies the white or serous vessels. This latter system is composed of a very large quantity of valvular vessels whose functions are similar to those of the veins. The lymphatics are fuller in young than in old subjects; and lymphatic plethora is characterized by white skin, well rounded figure, prominent and large subcutaneous glands, quick respiration, &c. &c.

183. If the irritation which dentition occasions gives place to that kind of hypercæmia which is called moulting plethora, this same irritation sets in motion the superabundant lymph, and phenomena of another order immediately ensue. Le Camus has described this condition. According to him, lymph being the nutritive matter, it follows that we must detect its vices in the development and nutrition of parts. While the children are properly nourished, the lymph is in exact proportion to the other fluids, and the vessels are not surcharged with it; but if they are permitted to have a diet too succulent or even too abundant, a thousand

evils result, that can only be attributed to superabundance of the nutritive fluids. We must suspect this state of things when the body of the infant grows with unusual rapidity; this precocious development seldom occurs except they are fed upon too rich aliment or are indulged with too great quantity of food. They live upon milk too thick or too nutritious for easy digestion, or else they are stuffed every hour of the day and night with bouillic or milk. The mother is ambitious to have a fat plump child, and the father congratulates himself upon the thriving appearance of his infant; but it is a sad thing for the little subject of their care to have fallen into their hands. When at the time of rapid development, the mass of blood is surcharged with such a quantity of lymphatic juices, that nature cannot employ them, either in increase or sustenance, she determines a part of them to certain organs, and usually the most feeble are engorged.

As this rapid development happens about the time of dentition, and especially when the canine teeth are appearing, it is at this time particularly that children are tormented with vomiting, diarrhœa, and profuse salivary discharge. If they are constipated the belly swells, they are sleepless, troubled with sudden alarms, and liable to convulsions or to epileptic attacks. The fatter they are, the more imminent is the danger. If the lymph becomes thick or acrid the infant rejects it from the different organs with a force proportioned to their vascular activity. When it is carried to the lymphatic glands it occasions obstructions in the mesentery, or produces scrofulous swelling or ulceration in the neck; when thrown upon the articulations it occasions rickets, malformation of the bones, &c. Dentition is accused of all these ravages, an error which has influenced the treatment and caused the death of a great number of children. Has nature so formed us that we run the greatest risk of losing life when we have just received it, or when she is busied with the means of its preservation? And are we particularly liable to be destroyed by her effort to furnish us with teeth, which are not essential to life, while all the other parts of the body are prepared and developed without pain or peril? We cannot believe it, and we should reject the error of nurses and mothers who in their anxiety to have plump children, stuff them night and day, and through vanity or ignorance, procure them the engorgements we have spoken of. We are con-

firmed in our opinion by the fact, that we meet with children that escape all the accidents of dentition. Whence arises their exemption? undoubtedly it is the result of better management. The eruption of the teeth is not always painful. How many children have cut them without its being perceived? Whence arises this error, so general even among well informed people? It is founded upon the observation that many disorders happen during dentition, and are of course attributed to this cause. The poor children cannot correct the mistake; they cannot speak, and they have not sufficient knowledge to resist the treatment that destroys them. Carry your remedy to the source of the evil; attack it by regimen and purgation, and you will prevent all the disorders in question.

184. In these remarks I have reiterated what I have endeavoured to inculcate in many previous pages of this treatise; but some things require to be frequently repeated, and among those are the precepts which lay at the foundation of the physical education of children, and which serve to sustain these little ones against the numerous evils that menace their existence. All the disorders that spring from lymphatic plethora are diminished by serous evacuations, and hence purgatives are beneficial. Rhubarb alone or combined with a little calomel is the best of these. This drug is so generally employed in the disorders of early infancy, that it has been termed the panacea of infants.

185. Vesicatories are of utility in the disorders of which lymphatic plethora is the cause; principally when the lymph is somewhat thickened; which is a common thing. These topical applications succeed best where the children are very fat; that is where the lymphatic temperament is strongly developed. If deceived by this kind of corpulence, the physicians have recourse to leeches, they will do mischief, and will deprive themselves of the aid which nature can render when properly assisted. The condition in question has some analogy to the hydrocephalic debility, (158) of which I have already spoken, and to the pathological states of which we are about to consider in the next article.

The vesicatories are applied behind the ears and neck, on the arms, and elsewhere if it be thought proper. The moxa offers great assistance.

ARTICLE III.

Of the Engorgement and Obstructions of the Mesentery of the Rickety Constitution, and of Rickets.

186. I connect in this article the lymphatic embarrassments of the mesentery, the disposition to rickets and rickets itself; because these three conditions are analagous, and because they exercise equal influence in enfeebling the constitution of children and impeding dentition.

187. Every day we see children that live upon bad milk, or upon grosser food, fall away in all their members, while their belly is hard and swollen. This condition occasioned by disorders in the mesentery, and particularly by the fullness of the lymphatic vessels and the engorgement of the glands, so abundant in that region, so greatly interferes with nutrition that the extremities become emaciated, ossification languishes or is arrested, and a slow fever wastes all the parts. In the midst of this general disorder dentition is suspended.

The diarrhœa which is one of the most formidable symptoms, increases day by day until it becomes colliquative, the temples sink, the face becomes very pale and elongated; the eyelids are swelled after sleep, and the shoulder blades project. Soon the aliments pass through the intestines unchanged; the urine is in small quantity, sometimes thickened and often of a reddish hue. The umbilical region is very sensitive to pressure; the sleep is broken; fever appears towards evening and becomes ardent; the mouth is parched, the skin very dry, and the progress of marasmus announces the approach of dissolution.

188. Such is the fearful disorder to which Sauvages, the first of nosologists, has given the name of "Physconie Mesenterique," because the mesentery, its glands and lymphatic vessels are the true seats of the disease. It is vulgarly called 'carrean,' and is technically known as "etisie" or mesenteric atrophy. This disease is one of the most serious that children are liable to; it attacks life in its source, since it destroys the principles of nutrition. When, notwithstanding the extreme feebleness that it occasions, nature makes some effort to effect dentition; the diarrhœa changes to a dysentery and ineffectual dentition hurries the disease to a fatal crisis.

189. I feel at liberty to decline entering into any detail on the treatment of mesenteric atrophy, since I have devoted a treatise especially to this subject; I will repeat, however, that mild resolutive remedies, external and internal, are the essential agents of cure. Among the internal medicines I use the "terre foliæ of Selle," given in water, or better in an infusion of chamomile, or decoction of madder root, or something analagous. This liquor of "terre foliæ" is a true acetate of potash. It is prepared by saturating the carbonate of potassa with acetic acid, to which is added the aqueous tincture of rhubarb, and antimonial wine. The calcareous muriate, is a salt which owing to its low price and useful properties is valuable for popular use. The red hydrosulphuretted oxide of antimony, combined with calomel, and augmented by sugar, forms an excellent remedy. Whatever internal means may be adopted, will be seconded in its action by laying upon the abdomen a plaster of hemlock mingled with the 'diapalme,' or other counter irritating applications.

190. After having remarked that children who have uncommonly large heads, (178) those whose lymph is acrid or thick; (183) and those that labour under lymphatic mesenteric engorgements, (187, 188) are disposed to have bad dentition, it will not be hard to show that the union of these conditions constituting the rickety constitution, offers the greatest obstacle to dentition and renders it laborious and dangerous.

The disposition to rickets is, so to speak, a degree of rickets itself, and there is but one opinion as to the pernicious action which this malady exerts upon ossification and consequently upon dentition. We see every day that the revolution which dentition produces in the system, suddenly develope rickets, and the child which before appeared perfectly well formed begins to be deformed as soon as it arrives at this epoch. This circumstance proves that dentition exerts a pernicious influence upon the development and progress of rickets; while the latter throws great difficulties in the way of dentition. It is this, as the celebrated Astruc and Hunter have remarked in the case of syphilis, that a morbid disposition is changed into disease where the material cause has been more or less forcibly put into action.

191. Rickets, called noueure, when its effects are displayed in checking the growth, and swelling the epiphyses, deforming the

long bones, announces itself, according to M. Lieutaud, by feebleness of the legs, by a sort of stiffness of all the parts, by premature intelligence, largeness of the head, attenuation of the extremities, and finally by the tardy and painful eruption of the teeth, which soon decay.

It may be well to make a remark here, about the indication to be drawn from precocity of mind. The English fear the rickets when a child talks before it can walk. This test is too general, because a child learns to speak sooner if it is much talked to, and it will walk much more speedily if it be carried little in the arms, and suffered to train its limbs by rolling and crawling upon the ground. Besides mental qualities are to a certain extent inherited like physical ones, and children born in cities are consequently quicker than those born in the country.

192. This observation is the more worthy of attention, because it is not a property of rickets to develop the intellectual functions with rapidity. The translator of Rosen's treatises on the diseases of children, after having said that rickety children are more peevish and ill natured than others, remarks that they are also uncommonly sluggish. He says he has seen them so much so that they would remain wherever they were placed, without crying hardly noticing the mother or the nurse. He adds that he always suspected a rickety constitution where the bones were very easily broken. He considers this fragility as near akin to rickets.

193. All who have described this disease have enumerated the symptoms above mentioned. M. Strach has added some peculiarities. According to him a rickety child may be distinguished by a pale and puffy appearance of the face, and by the citron or sulphur colour of the cheeks. Rosen, the first of authors on the diseases of children, has remarked that the subjects of rickets in general, manifest the disposition to the disorder by the largeness of the bones at the articulations, the looseness of the skin, the prominence of the belly, especially on the right side, the fullness of the face, the pallor and swollen appearance of the countenance, and the leanness of the body. There is ground for apprehending this disorder, if at dentition the skin becomes flaccid, the stomach tympanitic and the chest prominent. From the ninth month until the completion of the second year, this matter is worthy of attention.

194. Few authors have attended to the opinion that may be drawn with regard to the predisposition to rickets, from precocious dentition. It is nevertheless matter of experience that as precipitate growth is one of the effects of rickets, so a disposition to that malady is announced by untimely dentition. Thus we read in good authors that the fear of rickets may be in proportion to the rapid appearance of the teeth. This remarkable opinion which appears to be stated at a venture when we do not consider the disorder in all its bearings, is somewhat analagous to the declaration of Alphonso Le Roy, that morbid causes sometimes accelerate dentition. I have often seen, he says, that a child has cut one or two teeth before the ordinary term, when the nurse has had fever, or when she has had a gathered breast, or even been overheated. Her milk being surcharged with caloric, accelerates dentition; as vegetables are forced forwards by artificial heat and frequent watering. Their precocious frail flowers fall without fruit; so the precocious teeth of these infants decay and fall out soon after their eruption.

195. From these results of observation, we may perceive that the difference in force or feebleness of the constitution, and more especially, in the degree of viscosity or acrimony of the humours, which distinguishes different periods of age, explains the varieties of action in the causes of maladies. It is evident that the development of rickets depends upon the first effects of nature to furnish the teeth, and some have supposed that this malady has no other exciting cause. This opinion has much to sustain it when we observe that one of the principal influences of rachitic action is to retard dentition; to throw great impediments in the way of the organic forces while forming and developing the teeth, or to injure directly the beauty and the integrity of these little bones; and reciprocally that one of the effects of dentition is to rouse up the slumbering rachitic action, to multiply the dangerous impressions that this vice has made upon the system, and to establish the mode of alterations which will produce the most extraordinary changes in the osseous system.

196. Nobody has denied this dangerous reciprocal influence of dentition on rickets; but the causes of the phenomena have been variously explained.

Stoll has sought the cause in the three attendants of this organic development, pain, fever and the swallowing of a great quantity of saliva. The first two he thought were rather antagonists to rickets, and therefore he accuses the large quantity of swallowed saliva with depraving the digestion of the children and thus producing the disorder in question.

197. Lorry supposes that the convulsions that so frequently accompany dentition are the cause of rickets. He thinks his observation of dentition authorizes this supposition. It is not probable that this cause is sufficient; it may occasion deformity and in this way increase the effect of rickets.

198. It has not been sufficiently considered by those who have endeavoured to explain this subject, that rickets is connected with the perils of dentition by the shock which the whole osseous system suffers by the peculiar exercise of force necessary to bring out the teeth, and by the congestions which precede dentition, causing diminution of all the secretions, and provoking lively and protracted irritation. In this state of general suffering the movements of nature are uncertain and disturbed; the osseous and mucous substances which abound in the animal economy, are directed upon certain points; the mucous matter is thrown upon the glands; the osseous upon the bones. Thus rickets and scrofula, two maladies that are often established at the expense of each other, take their rise from the revolutions caused by dentition.

199. To have a just idea of the influence of rachitic action upon dentition, we must remember that in very young infants there is only the disposition to rickets; in those somewhat older there is most frequently only that degree of the disease which consists in swelling of the epiphyses and arrest of growth, and when rickets is fully established, it develops itself in the younger children by curving the limbs, in the older by deformities of the bones of the chest and the spinal column.

200. In order to prevent the accidents of dentition, by counteracting the rickety disposition, it is well to use strictness with regard to the diet both of the infant and the nurse; to animalize their food as far as is necessary, and to deprive them of such aliment as might produce mucus, glairy, or acid matters; all such as tend to lessen action. Food of an opposite kind is eminently useful. Good soup and spices are suitable, as well as

exposure to the air and sun, of which I have already spoken ; these means second the action of remedies.

201. M. Bonhomme, who has published judicious opinions upon rickets, extols the use of alkaline lotions, and the administration of the phosphates of lime and soda. These external and internal medications are extremely useful and should never be neglected, alkaline lotions prepared with ashes or potash, strengthen the tissues and alter advantageously the condition of the system. The phosphate of lime furnishes the materials of ossification which are wanted, and the phosphate of soda, which possesses aperient and solvent qualities stimulates and opens the mesenteric passages, and dissolves the mocosities with which the primæ viæ abound in rickety cases.

202. M. Strach, has mentioned, as an approved remedy, a mixture of iron filings, rhubarb, and sugar, to be taken morning and evening.* If it purges it may be given once a day. At the end of a month the child appears very hungry and digests well the food it takes. This is followed by an abundant flow of urine, which takes with it the puffiness of the face ; the pale colour of the skin and the yellow of the cheeks disappear next ; the flesh becomes firm ; at the end of three months the lips and cheeks are red, and in four months the cure is complete. This treatment has at least the great merit of simplicity.

203. Bouvard made the mercurial syrup of Bellet fashionable in Paris. He combined it with the antiscorbutic juices, and some praticiens have written in favour of this syrup as almost specific in scrofula and rickets.

204. The carb. of potassa has been more generally thought useful. Levret had great confidence in it, and Dr. Abildguard, of Copenhagen, represented it as a powerful remedy in rickets.

205. Maria P***, a lady whose morals were not the most rigid, was brought to bed in May, 1780, of a daughter that looked very well. There was nothing remarkable about it except that the head was large in proportion to the body. When I first saw the child, some persons were lauding its beauty, its quietness, and above all its habit of long sleep. These circumstances did not

* Five grains of iron filings, five of rhubarb, and ten of sugar, to be given at a dose. To very young children one half of the quantity is sufficient.

seem to me to be as advantageous as they appeared to the nurse. I explained my apprehensions in a very serious way, but the mother recovering I lost sight of the little Maria for the time. When she was six months old I was consulted about some tumours which had appeared in various parts of the body. I learned that the child had always been indolent, quiet, and almost indifferent to the mother's breast; that its nourishment had been milk, panada, broth or soupe-maigre, bread, and chewed meat; that from the second month it had begun to fall away; its flesh had become soft, its skin loose, its buttocks shrunken, and its belly swollen. The excrements had always been green, the breath and the odour of the body acid. The tumours spoken of were not observed until a fortnight before I was called to see it. These tumours consisted of seven knots upon the ribs at the articulation with the sternum; five on the right and two on the left side; of eleven similar tumours upon the course of the spine, seven on the right side and four on the left. The spine was a little curved and the chest protruding on the right side seemed to correspond to this deviation. The two maleoli of the right foot were swollen; the articulation of the knees on the same side were also swollen, and the external condyle of the left femur was larger than ordinary. The child coughed; when undressed it did not manifest any pleasure; and when placed in a sitting posture it did not sustain itself as well as children of that age usually do. The fontanelle was very open; the face swollen; the belly large and hard, and the limbs attenuated. The mouth manifested no signs of dentition.

The condition of little Maria was a bad one, but the mother insisted upon efforts being made for the cure of the child. I directed her to live with great regularity; to eat more animal than vegetable food, and to drink every day, some water in which crushed juniper berries had been infused.

Moreover I directed the mother to take three table-spoonsfull a day of a strong tincture of quinine, in every eight ounces of which twenty grains of carb. of potash were dissolved.

This same tincture was also given to the infant, though in much smaller doses at first; to wit, a tea-spoonfull four times a day; increasing the dose to double the quantity.

At intervals, there was given to it a spoonfull of animal jelly well spiced. Twice a day it was subjected to the vapour of juniper berries, mashed and thrown upon burning coals. When thirsty it drank the aromatic drink prepared for the mother, and lastly it was bathed every day over the belly with an embrocation of olive oil in which a sixth part of aqua ammonia was mixed, and once or twice a week it was purged with two or three grains of calomel and six, eight or ten grains of rhubarb. These remedies were continued for twenty days, and their effects were so happy that the mother believed that a radical cure would result. She relaxed her care and finally discontinued the curative course. At eleven months the child cut the first incisor teeth of the superior jaw, and shortly after the corresponding ones of the lower jaw. This dental eruption destroyed a great part of the advantage that had been gained. The first two small molars of the superior jaw, pressed forward: cough reappeared and the lungs gave evidence of catarrhal congestion. The four teeth already cut, blackened and one of them become carious; respiration became laborious, diarrhœa returned, fever followed, stupor and impossibility of sucking succeeded, and death occurred in the middle of the fifteenth month, after three days of feeble convulsions.

206. This case, independently of its termination, is interesting as furnishing an instance of confirmed rickets before the time when this morbid affection is said by authors to appear, viz: the ninth month. It presents the precursor symptoms and the confirmative evidence of this malady, not at all complicated with syphilis; and doubtless it would have terminated happily, but for the premature suspension of the treatment. It establishes what has been said, (190) that rickets exercises a powerful action upon dentition, and that dentition re-acts dangerously upon rickets.

207. The cause of this disorder are opposed to the progress of ossification; therefore its radical treatment must be directed to the destruction of morbid acidity, to correct mucosity, and to fortify the constitution. These indications are difficult to fulfill. Sometimes they cannot be obtained without the aid of mechanical means, which support the enfeebled parts and assist the action of remedies. From the fact that practitioners prefer the use of alkalies and alkaline substances in the treatment of rickets, we might infer that the rachitic diathesis is intimately connected with the exis-

tence of improper acid, and that it is necessary, not only to destroy it, but to neutralize its many effects; among which we must reckon the destruction of the phosphate of lime, or solid substance of the bones.

208. It is important to observe here that when the nurse observes a strict regimen, the milk is not injurious in this disorder, as has been inferred from facts, badly observed, badly judged of, and entirely too general. Nevertheless alkalies and mercurials ought not to be too long persevered in. They produce an alteration of the morbid fluids without removing the effects of rickets. Hence Glisson has said that, mercury whose utility in the first stages of rickets no experienced physician can deny, had nevertheless killed some of his patients.

ARTICLE IV.

Of the unnatural state of the Alveoli and the Gums.

209. There is a mutual consent and dependence throughout the animal economy. Feebleness of constitution, exuberance of fluids engorgement of the principal organs of nutrition, and the organic disorders of those systems which appear to be the best protected from injury, all act more or less injuriously upon the formation and development of the teeth: and on the other hand dentition encountering obstacles from the gums and walls of the alveoli, re-acts upon the whole machine and produces consequences of which death is often the result.

210. A child two years and a half old, whose plumpness announced a good constitution, was troubled for several days with pain in the gums, occasioned by the piercing of four teeth at once, and by high fever which accompanied it. These circumstances destroyed its repose night and day. The little patient whose belly was distended and tympanitic cried without intermission. It had taken some laxatives which had not prevented the constant discharge of green and liquid stools. It had frequent sweats which not relieving it only added to its distress. Its hands were constantly in its mouth and the salivary discharge was abundant, yet the mouth was hot. The gums, pressed by the teeth were distended, and prominent, their colour was bright red, and their pain was increased by pressure.

These appearances rendered it evident that difficult eruption of several teeth at once was the true cause of the child's suffering. On touching the gums they seemed hard and resisting, and authorized the supposition that the teeth were very near the surface, and only prevented from coming through by the opposition of the dense tissue of the gums whose division had not been assisted by proper means; (137) nevertheless the child was treated as though it was labouring under a mere humoral fever. After being apprized of its situation, the reporter of this case recommended certain remedies, among which the section of the gums was not forgotten.

This operation so plainly indicated and so immediately necessary, was not agreed to; and a consultation was had with a physician and a skilful dentist. These gentlemen were not convinced that the disorders observed in this child were the effects of difficult dentition, although by the state of the gums they perceived that the pressing of the teeth might be implicated in the diseased phenomena; but they persisted in believing that the fever was humoral and independent of dentition, which would terminate happily when the fever should have been subdued by the proper remedies. Consequently they persisted in the treatment originally instituted; and in order to relieve the gums they ordered them to be rubbed with honey and hare's brains—ridiculous nostrums in vulgar use. The teeth did not come through, the gums grew pallid, the fever continued and became chronic; finally the child died in six weeks.

The gums were examined after death; they were thin, but nature had not been able to terminate her work and the resistance of the gums was not overcome. These being cut the teeth appeared ready to come through.

The other teeth still concealed in their alveoli appeared to have had no part in the production of the accidents above mentioned; and it was only the first that really produced the difficulty.

211. Would the section of the gum have secured the eruption of the teeth, already elevated above the margin of their alveoli? Would it have prevented the train of consequences which ultimately proved fatal? The post mortem examination leaves no room to doubt it. The symptoms were caused by the unsuccessful effort of nature to bring out the teeth; the irritation and inflammation of the gums caused such a change in them as prevent-

ed their division by the natural means, and all the consequent disorder would have disappeared had the operation been performed. We are justified in declaring that every day we see the most dangerous effects produced by inflammation of membranous parts when they have not been relieved by proper incisions. This truth will be better established by reasoning and by facts in the second part of this treatise.

212. It is proper to consider the unnatural state of the alveoli and the gums as obstacles to dentition; the first may be too contracted; the second too hard and callous. We have seen (142) how much the imprudent use of the coral contributes to harden the gums and to render them less easy to be divided, and every body knows the effect of the handles of tools on the skin of the hands of those who employ them in their labour. Some will say that children are instructed by nature to carry the fingers to the mouth while teething; it would be as rational to say that the automatic suspension of respiration by those who are suffering under inflammation of the lungs ought to be recommended. Let the gum be pressed with a hard body when its tissue is thin and yielding, this may be useful: but if the same thing be done while the teeth are yet in the alveoli, or when the gum is thick and hard, it will impede the progress of the teeth, by multiplying the difficulties which grow out of the condition of the part.

PART SECOND.

Of the Accidents and Evils that depend upon Difficult Dentition, and the Means proper to remedy them.

213. The first part of this treatise has been devoted to the examination of the dispositions that infants may have to difficult dentition; and I have pointed out in detail the means necessary to combat these dispositions, and to prepare the infant for easy dentition. But when from the neglect of these precepts, dentition is more or less troubled, it offers to the observer a new series of accidents and evils which it is necessary to understand in order to treat it to advantage.

214. I call the *accidents* of dentition those phenomena which are almost always, or at least very generally observed during teething, and which when on a large scale become essentially morbid. These phenomena are such as denote the trouble of digestion and the suffering of the mouth; to which we may add others that appear to be more or less connected with these. The *diseases* of dentition are of a different class from these. They only appear occasionally, and render dentition the most dangerous period in infant life. Both are either primitive or secondary; the first have their seat in the gums, the second in various parts of the body; when united they form a perfect idea of difficult dentition.

215. When a child has a sound constitution, and moderate sensibility, and when it has been well managed, it is rare that it suffers seriously in dentition. On the other hand it is equally rare to find one exempt from such suffering whose constitution is bad and mobility excessive, and who has been the subject of many dietetic blunders. In the first class of infants, dentition is barely dis-

tinguished, by the heat of the gums, the slight salivation, the scarcely painful sensation which causes the child to carry to its mouth its fingers and every thing it takes hold of, and to press the breast of its nurse when it sucks; by the eagerness with which it sucks and the pleasure with which it drinks. To these signs must be added the following. There is a levelling of the gums; a state which the nurses call, "doubling the gums;" tickling of the nose which leads the child to rub it frequently; a symptom that the nurses, are apt to mistake for indication of worms in the intestinal canal: sneezing; bright redness of the cheeks alternating with paleness, or appearing only on one cheek while the other remains pale; another symptom often mistaken for the effect of worms.

Then also comes on diarrhœa, more or less moderate, but always advantageous; and increase in the quantity of urine, and many signs characteristic of mobility accidentally acquired; such as impatience, readiness to weep; nocturnal alarms, starting during sleep, the sardonic laugh in sleep, obstinate cries upon awaking, &c. Sometimes we are surprised to find an infant with teeth without our having observed these preliminary signs.

216. Among these signs we must reckon the particular state of the gums. As the teeth press upon them, they swell and become prominent and the edge of the gum which corresponds to that of the tooth becomes white, while the other parts maintain their redness and seem to circumscribe the white portion. It is this swelling which is always itchy and sometimes painful. It is accompanied by some degree of swelling of the face and of the glands under the angles of the jaws, salivation, &c. The augmentation of the volume of the gums and their redness is much more apparent than in the natural state. Their sensibility is ascertained by the evident pain caused by pressure upon them. Finally, the gums, notwithstanding their tumefaction, are hard and shining, and touch discovers the tooth ready to come through. The progress of easy dentition cannot be mistaken.

217. In contrary cases, that is in difficult dentition, salivation is profuse; the gums are also very painfully swollen with engorgement of the parotids and the other salivary glands; there is pain in the ears; swelling of the whole face; disorders of the eyes

swelling under the eyelids, trembling of the eyelid, and cutaneous eruptions of an anomalous character, as Lorry has said.*

The inflammation of the gums is no longer imperceptible but intense, often attended with aphthæ, and often proceeds with rapidity to suppurations or gangrene.

This inflammation propagates itself to the arch of the palate, to the amygdalæ, to the pillars of the arch, even to the lungs, stomach and intestines, and is the cause of the crethyma which is observed at the anus and over the buttocks. The organs of digestion are the seat of irritation which manifests itself in vomiting, cough, colic or hiccough. The desire to drink or to suck becomes raging, the sympathetic diarrhœa immoderate; the excessive mobility degenerates into convulsions that commence in the eyes and the muscles of the face and pass to other parts of the body: fever is lighted up; sleeplessness, confused cries, delirium or madness ensues; finally the child dies, or drags on in life until it is terminated by slow fever, hydrocephalus, or rickets.

218. Such is a picture of the accidents which accompany painful dentition. A child cannot be attacked with them all without the most frightful result. The more numerous these symptoms are, the greater the danger in dentition, and the less likelihood there is of relief from medical remedies.

219. In difficult dentition the preludes authorize the suspicion of coming perils. From the fourth month digestion is singularly depraved; the milk is not half assimilated; it is vomited with great frequency and celerity, or passes off by serous green or yellow stools, which stain with a greenish tint the linen upon which it falls. If there is constipation the matter is worse. The heat and the dryness of the mouth are great, the face and forehead hot, salivation is irregular; sometimes profuse and at others suspended; then the whole interior of the mouth is dry and brilliant; the gums swell largely, even before the walls of the alveoli separate; that is before the upper margin of the jaws are flattened. The child thrusts its fingers into its mouth with eagerness and cries when it touches its gums. It sucks greedily, quits the breast with unwillingness, seizes and relinquishes it, showing the desire for drink and the pain which it experiences in sucking. The

* De Morbis Cutaneis, page 117.

jugular glands swell, the amygdalæ are enlarged and respiration and deglutition are painful. The eyes are red and watery; the eyelids swell; the sleep is unquiet and short; and great dangers are about to be experienced.

220. These accidents appear if we lose any time in giving attention to the children. Regimen is necessary both for them and their nurses. Good soup and the tender flesh of young animals ought to compose the diet of the nurses, rather than vegetables, whose acescent juices augment the tendency of the milk to sour. Soothing drinks ought to be used plentifully in order that the milk thus medicated may relieve the heat of the gums and refresh the stomach and the blood of the infant. This is not all. The nurse must be mindful of her own health. If she spends the day in amusing the child and the night in nursing and cradling it, her health will be deranged and her milk heated and injurious to the infant. It is not at a time when the health and courage of the nurse are so much needed, that she should be careless of the wants of her own system.

221. It may also be necessary for the nurse to use some medicines, especially some absorbent or alkali, (157) but above all she must not give the breast to the child every time it cries. Disturbed by the cries of teething children, nurses have recourse to their milk to quiet them. There is reason for this undoubtedly, but if too prodigal of it they favour the vomiting or diarrhœa. They never think that while nursing the child on account of fretfulness and not from necessity they are enfeebled, lose their appetite and fall into languor. I saw a young and charming woman, who nursing her second child contrary to the wishes of her husband and her family, because she had lost the first at nurse, though labouring under tendency to phthisis, was destroyed by rapid consumption from the cares she bestowed upon the child during dentition.

222. In describing the accidents of dentition we distinguish those that are consecutive and secondary, from those which arise immediately from dentition. The first are usually more serious than the second; being spasmodic or truly humoral. I am about to describe both kinds, being guided by no arrangement except that which grows out of practical observation.

1. *Of Vomiting.*

223. The vomiting of dentition is sometimes so moderate as to require no remedies ; but as it is always a symptom of irritability of the stomach, the irritation of the abdominal viscera, and the disorder which pervades the digestive apparatus, the nurses should give but little milk at a time, and nurse the child more frequently. They should rub the children with warm dry cloths over the region of the stomach ; and they may also bathe the epigastrium with carminative and nervine oils, such as that of aniseed, &c. finally bags filled with soothing and tonic substances may be laid upon the stomach. These are composed of *theriac*,* in which may be incorporated some powdered spices ; or of a plaster sprinkled with camphor, opium, mace, &c. The tincture of camphor and of opium may be employed in friction with advantage, as the skin of infants absorbs considerably, and imbibes readily volatile and aromatic applications.

224. Like all the symptoms of difficult dentition, vomiting is either nervous or humoral. Nervous vomiting depends upon the nature of the irritation of the gums. It is not accompanied with the symptoms of depraved digestion, and is subdued by emollients passed little by little into the mouth ; injections containing a decoction of soothing plants or seeds, and by anodynes, such as *theriac*, a small dose of *diacodium*, &c.† Antispasmodics frequently succeed ; a little musk or camphorated nitre will often be sufficient.

225. One or two leeches, according to the age of the child, applied to the pit of the stomach, or behind the ears, may allay vomiting when it depends upon inflammation of the gums and slight erythema of the gastric mucous membrane. A warm bath and fomentations to the belly are also useful in such cases ; as in the preceding, (224). It often happens that vomiting produces sanguineous obstruction in the vessels of the stomach, and the most direct remedy is an evacuation of blood, proportioned to the age and strength of the patient.

226. Again there are vomitings, and these the most common perhaps, that are occasioned by acids or other irritating matters.

* A preparation formerly in use, the basis of which was viper's flesh.

† A syrup of poppy heads.—*Trans.*

Trans.

These are removed by purgatives, absorbents and tonics. I have spoken in various places of remedies of this sort, and I need not repeat them here. It is very evident that dentition troubles digestion exceedingly, therefore it is necessary to purge children in dentition and to prolong the advantage thus obtained, by regularly using tonics and absorbents.

2. *Of Purgings.*

227. The looseness of the bowels needs no attention unless it exceeds the bounds of acknowledged usefulness. This remark has been made before; (215), nevertheless diarrhœa, depending upon difficult dentition contributes to render the state of the child more serious, (134). Profuse and frequent evacuations retard the appearance of the teeth, because they enfeeble the patients and impede the series of acts necessary to dentition. Authors have observed that when the stools are frequent and of a dark green colour approaching to black, the prognosis is bad; it is worse if the odour of the dejections be very fœtid. But if the matters discharged resemble the natural dejections; if they become less frequent though still sufficiently so; and if their consistence becomes less liquid, the prognosis is good. Such looseness of the bowels relieves the head and the gums and instead of embarrassing dentition it aids it; supplying the place of the laxatives which in similar cases are often indicated.

228. Thus the purging of dentition has a favourable side; it is nevertheless necessary to watch it, lest it should increase, become too serous, colliquative or dysenteric. In general, purging is an accident complicating difficult dentition, and often results from depraved digestion. If this complication be not prevented by the ordinary means, the curative indication consists in diminishing or arresting this diarrhœa and in preventing its return. This may be accomplished by giving the children small injections of river water, or of the decoction of bran or flaxseed, or animal substances such as mutton or veal; by purging with cassia water, rhubarb, or the syrup or infusion of senna in the juice of prunes.

229. If these means, (228), well calculated to cleanse the primæ viæ of the matters which there cause all the disorder, do not accomplish the end required, we have recourse to ipecacuana, a

few grains of which will suffice to cause a moderate emesis. Vomiting cleanses the stomach and the first intestines, and gives a shock to the whole digestive apparatus which often stops the purging,

230. During the use of these remedies nurses ought to be extremely cautious to give the children but little milk; but especially they must avoid giving any heavy aliment. The creams of salep deserve some preference when much nourishment is required. As to the thirst that ordinarily takes place at this time, it is diminished by giving at intervals some spoonfuls of Sydenham's white decoction, rice water, &c.

231. It is very dangerous to employ astringents too freely to arrest the purging of dentition. The action of these medicines may be injurious by bringing on spasm of the intestines, irritation, constipation, inflammation and gangrene of the intestinal membranes. This, unfortunately, has happened. In comparing the results of purging and constipation, we find that the former are less serious than the latter. A loose belly is favourable to dentition, but it is necessary to restrain it within certain limits, and this may be done by tempering the alvine matters, by allaying irritation, and giving tone to the intestines. A useful remedy in this latter case is five or six grains of columbo in a little diacodium, or conserve of roses, or theriac. To this may be added with advantage one or two grains of nitrated camphor.

3. *Of Colics.*

232. Vomiting, (225, 226) and purging, (227 to 231) very common symptoms in difficult dentition, are generally accompanied by colics which occur in paroxysms, with intermissions, and which occasion much suffering to nursing children. Indeed to them there is no more painful affection than this. These colics depend upon some modification of the nervous system, on which many accidental causes, similar to those that derange digestion may operate; though we cannot deny that the products of bad digestion which have so much power to cause colics, are often themselves the effects of colic.

233. This morbid affection is not confined to teething children. It appears a few days after birth, and dreadfully torments a large number of children until the tenth or twelfth month.

Then this astonishing disposition to colic ceases and returns no more. In observing carefully, we ascertain that the age at which colic is most severe, and most frequent, is from four to six months; and we also know that it is about the fourth month that the milk begins to sour so remarkably in the stomachs of infants; it is at this time too that the first process—the internal process of dentition begins. Thus we naturally connect the ill digestion; the colics, which in many infants is only remarkable at this period; and the more or less laborious process of dentition.

234. Rosen has observed that an unequivocal sign of colic is, when in connection with some symptoms of that disorder, the child passes more urine than usual; so that it is constantly wet almost up to its arm-pits. According to Tissot, we may distinguish a nervous disorder by the quantity of very limpid urine, which one suffering under such diseases secretes and discharges. These two circumstances show that infantile colic is essentially nervous. Besides acids irritate the nerves rather than the muscles, and every body knows that the appearance of the intestinal matters passed from a colicky child, is green, or yellow which soon passes into green. These matters then contain an acid, or else having a great affinity for oxygen, they are on the eve of becoming acid. Tissot argued forcibly from this state of the intestinal matters that the nerves played the most important part in colic.

235. In my treatise on infantile convulsions I have carefully described the colic of nurslings, and I have advanced reasons that go far to support these assertions; and as colic forms the most common disease of sucking infants, we may easily perceive how depravity of the bile, doubtless under the influence of nervous action, could give to this animal matter, the acidity that distinguishes it and renders it capable of giving such acute pain. To judge by the cries and by the tears of children, by their stamping, by the irregular redness and pallor of the cheeks, by their doubling and stretching, and by the drops of sweat that sometimes stand upon the skin: these little creatures suffer much in their colics which leaving them and returning without manifest cause, terminate frequently by belching, by urine, and more frequently by stools composed of a glairy matter mixed with albuminous flocculi, which seems to be acid and which becomes green with more or less celerity. I have seen a child, which in cutting its teeth

suffered greatly, with colic, pass a large quantity of blood by vomiting and by stool.

236. Many nurses are under the unfortunate error that children never have colic except when their stomach is empty. This idea leads them to give a great deal of food, which is very injurious. There are some physicians also who think that all the contents of the *primæ viæ* of infants are necessarily acid; an opinion which leads to the improper treatment of their diseases.

The intestinal secretions of infants are sometimes of a putrid character. When this is the case, the wind discharged from the bowels is foetid; the colour of the excrements is deep greyish or yellow, but it does not become green by exposure to the atmosphere. The temperature of the body is equable but somewhat higher and more mordant than ordinary; this is especially perceived when the hand is held for some time upon the hypochondriac region.

237. This difference in the nature of colic, requires difference of treatment and of regimen which is auxiliary to it. I have described the course necessary to be pursued in the case of acid indigestion, (156). Ptisans made of animal substances, soups, alkaline or absorbent powders, tinctures or potions, are useful remedies; purgatives are also advantageous. We must not forget that glairy matters and wind accompany colic; hence carminative and anodyne powders have been used with success. Of this kind is the preparation published as a highly valuable formula, which consists of ten grains of florence iris, five grains of good saffron, and ten grains of fennel seed; to be taken at three doses, in milk.

238. A different course must be pursued in the treatment of *putrid* indigestion, (237). Besides weak lemonade, or rice water flavoured with citron, which the nurse should drink; the children should be given orange juice diluted with water and sweetened with sugar, when the bowels are costive, or a mineral acid when there is purging. The bowels should be cleansed by cream of tartar, or injections made of chamomile flowers acidulated with vinegar, or better, with carbonic acid gas.

239. In each case, (237 and 238), if we have no reason to fear exciting the children, we should give mild tonics, such as orange flower water, fennel water, barley water flavoured with cinnamon,

wine, &c. We ascertain that the children are over excited, when there is costiveness, and when eruption breaks out upon the face, or when those already existing are aggravated. I have seen many children in this condition. Sometimes this eruption is evanescent, enduring but for a few days, and somewhat resembling the exanthemata of mesenteric or gastric fevers. More generally, however, it is lasting and requires particular attention.

240. Spasm, as the effect of irritation exists in almost all forms of colic. This requires that the excess of sensibility be overcome by a prudent use of antispasmodics. The alteration of the bile, the alternating redness and pallor of the cheeks, the torsion of the limbs, the opisthotonic movement, &c. give sufficient evidence of the presence and intensity of spasm. To relieve or remove it we may use the infusion of linden flowers, the powder of 'guttete' with the addition of a little camphor or musk. Camphor has been proved to be a sovereign cure for that terrible kind of colic that has been called '*colique de misere*.' The sublimated oxide of zinc, (the flowers of zinc,) are perhaps worthy of entire confidence. M. de la Roche has used it according to the advice of Gaubins, in many of the spasmodic or convulsive diseases of children, and has derived advantage from it. I have also used this preparation freely and with success. As colic deranges digestion, so also depraved digestion exercises a pernicious influence upon the duration and return of colic; by fortifying the nerves of the stomach and intestines, we diminish and destroy this morbid condition. A case published by the physician just now named, proves this assertion.

241. A child, a month old, had convulsive movements of the face, affecting more particularly the eyes and the mouth. They had been perceived for several days but had now become so frequent as to recur at intervals of scarcely a quarter of an hour's duration. This child was moreover considerably enfeebled, its dejections were altered, it was troubled with wind and it was especially when this was about to pass away that the convulsive movement was observed. The physician gave several purgatives such as magnesia, rhubarb, &c. all of which appeared to be serviceable for a time, but no permanent relief was procured. This treatment was persevered in for several successive days, but the convulsions still continued. The physician then administered

the sublimated oxyde of zinc, as a palliative remedy, intending to return to the use of the purgatives. The dose was at first a third of a grain every three hours; it was rapidly increased to a grain, and a sensible amelioration soon appeared. By continuing the remedy, in this last dose for some days longer the convulsions which had lasted for several weeks were altogether relieved. Another remarkable effect of this remedy was that the intestines resumed their healthy functions and the stools became perfectly natural. Some time afterwards the same symptoms began to reappear when a few grains more of the oxide of zinc allayed them, and the child had no further return of them.

4. *Of Constipation.*

242. I have said, (231) that constipation is a dangerous accident in dentition; hence every effort must be made to combat and overcome it; children who suck old milk are often liable to constipation; those who suck acrid milk are frequently in the same state. The first means of relief is to change the nurse. Recent and serous milk is the most important of all remedies; this from a calm and tranquil nurse is uniformly useful. In each case the child should be bathed in warm water; we ought also to provoke a passage by taking off its diaper and holding it with its naked feet upon the floor. Lieutaud observes that the juice of the wall pellitory given in doses of a half ounce to an ounce, to sucking children, is generally sufficient to render their bowels sufficiently loose. The marmalade of Tronchin, a species of soft confection, made of the pulp of cassia, manna, the oil of sweet almonds and the syrup of violets, may be of use; its purgative quality may be increased by substituting castor oil for the oil of almonds, or by using a part of each.

243. There is a kind of constipation in dentition, occasioned or kept up by inertia of the intestines, and a mucous engorgement of the bowels without any indications of 'physconie mesenterique.' This sort of constipation does not require relaxing purgatives, but such as remove and destroy the mass of mucous matters; a combination of calomel and the red hydro-sulphuretted oxide of antimony, slightly camphorated and augmented by sugar to facilitate combination, is eminently useful. M. Dalberg, a Swedish physician, has recommended the tincture of colocynth; and this very

bitter remedy administered in manna, is not to be despised in relieving mucous constipation and preventing its unpleasant results.

244. By as much as tonic and bitter substances are profitable in this latter case, (243,) by so much they are injurious in the condition described in paragraph 242, and vice versa. It is according to the state of the system that the remedies are useful or injurious; when the seat of the *primæ viæ* is great, it is unnatural to prescribe manna and oils instead of emollient fomentations, and warm baths. Then manna, cassia, ordinarily produce a bilious acidity; oils easily become rancid, occasion burning acidity, and cause or increase colics. Syrups easily ferment and degenerate, and increase the evil they are intended to remedy; and it is a truth worthy of remark that often it is of less consequence to attend to the evacuation of the bowels than to the ability of these organs to improve these bad secretions which it is so important to alter.

5. *Of Salivation.*

245. Salivation is only dangerous when protracted or profuse. It is a symptom of the irritating cause found in the jaws. The infant at the breast does not spit, and as it chews nothing it uses little saliva. But as soon as it begins to get its teeth, and this operation establishes a point of irritation in the jaws and gums, it slabbers abundantly and constantly. The secretion of the salivary fluid is occasioned and increased by the excitement of the nerves of the teeth and gums, which correspond with those that are distributed to the salivary glands. The effect of moderate irritation is to augment the action of a part and increase the exercise of its function, but when irritation is great the result is different. The excess of spasm occasioned by the extreme irritation suspends the action and function of the organ. The flow of the fluids is suspended; there is dryness of the ducts, and generally consecutive engorgement.

246. Thus it happens in the salivary glands when these organs are moderately or excessively excited. In the first case they pour into the mouth a greater or less quantity of saliva; in the second this secretion is arrested; but there ensues swelling and pain in all the glands; heat and dryness of the mouth; pain in

the head, throat and ears; redness of the face; swelling of the eyes; ardent thirst; fever, &c.

247. Augmentation of saliva is not a serious symptom in dentition; generally it is favourable. Consequently we should endeavour to excite this secretion when it threatens to cease. This is accomplished by keeping the child sufficiently warm; frequently moistening its mouth either with the nurse's milk, or mild drinks. It may be excited by bathing the jaws and neck with warm oil; by applying to the child's feet, when it is asleep, bladders half filled with warm milk or some warm emollient decoction; by moistening the gums and the mouth with mucilages sufficiently diluted; and as great irritation is apt to be connected with some degree of inflammation, it follows that aberrations of salivation can be advantageously combatted by leeches.

248. Salivary engorgements are nevertheless sometimes of a cold and lymphatic character. Then they require a different treatment; reiterated purging, aromatic vapours and frictions, and finally the application of blisters. The English have proposed the tincture of soot as a remedy in these cases; and doubtless it is of service. Hamilton has recommended little lateral blisters placed behind the angles of the jaws or the neck.

6. *Of Achors or Crusta Lactea*

249. This is a malady of the skin which commonly appears upon the face. The ancient Greeks and Arabians have identified it with scald head, and authors have given it different names, such as *crusta lactea*, *ignis volaticas*, *favi*, *tinea*, *porrigo*. In vulgar language it is called milk crust.

250. The *crusta lactea* attacks infants at the breast more frequently than those which are weaned; hence its name. Infants of six months old are more liable to it than such as have teeth, and it usually disappears at the end of the year, or about the time of weaning. In some, however, it appears later and continues until the accomplishment of first dentition. Strach has seen it in children six years old; this however is a rare occurrence. He mentions the son of a sculptor who had it for six years, and the son of a merchant who had a return of it when four years old.

251. Occasionally it happens that this eruption appears in adults; I have treated three subjects of this kind, and Fischer has made

this fact the foundation of an essay entitled, "De crusta lactea adultorum." Notwithstanding this, crusta lactea should be considered an eruption proper to infancy, and connected with dentition; whether this occasions a peculiar degeneration of the milk, or generates the specific cause of the eruption.

This disorder is called 'crust' because the skin when affected by it is covered with a crust moistened with serosity.

252. It attacks the forehead and very often the cheeks; its pustules sometimes large, and sometimes pointed, are filled with limpid, glutinous matter. When a pustule breaks it discharges a ruddy, adhesive matter which adheres to the pellicule that enclosed it, and both stick to the skin. As these pustules open at different times the skin becomes covered with a yellowish red crust. But the skin often cracks and discharges a glutinous humour, which hardening in its turn, increases the thickness and firmness of the crust. The skin is sometimes seen, perhaps in cases of idiosyncratic constitutions, to become as hard as leather at the place of disease, while the parts beneath are swollen. The jugular glands generally swell; the parotid rarely does so.

253. In some, these crusts are only found upon the cheeks; in others they extend to other parts, even to the anterior and sometimes to the posterior of the ears. Then the chin and the forehead become infected, and the whole face is covered as with a mask. No part escapes but the eyelids, which white and deprived of hairs, resemble at a distance the holes in a mask.

This disease rarely affects the globe of the eye. This never happens except when the pustules are few and dispersed over the cheeks. On this account this sort of ophthalmia is hard to be distinguished and can only be recognized through long experience. Sometimes this achorous disorder produces deafness, and pours out sanies by the auditory meatus. In such cases we have reason to apprehend deafness or total loss of the organ of hearing.

254. But crusta lactea is not confined to the face; it may appear upon any other part of the surface. It has been seen upon the chest, belly, neck, arms, thighs, buttocks and loins. I have seen it myself in broad patches upon the arms and cheeks of a lady twenty two years of age.

255. The essential cause of this malady is unknown, but every thing declares that it is specific, and M. Strach proposes to call it

the achorous miasm. This observer was convinced that this disorder was communicated to the child, when the mother had been attacked by it; whether the infant was fed with the mother's milk or with that of a cow, or indeed with any other aliment; it was also plain to him that a nurse who had been the subject of this disease might communicate it to her infant, (185) although its parents' might have been entirely exempt. M. Strach also observes that he has often known a nurse to infect children of different families with this disorder. But a strange nurse who had been at a previous time a sufferer from it, was more likely to communicate it to the child, than the mother who did not nurse it.

256. Mothers of families, silly women, and some physicians too, think '*crusta lactea*,' to be unattended with danger, and that after its cure the children are the better for it; their countenance being more beautiful, and not likely to be marked by small pox. This is all erroneous. There are many examples at hand to prove that *crusta lactea* has terminated fatally by infecting the lymph and engorging the conglobate glands; for it is a property of the achorous poison, when it is not entirely expended upon the skin, to throw itself upon the mesenteric glands, and to originate disorders there, which often prove fatal. When the cure of this disease is abandoned to nature, it is slow; art operates more promptly. One of the symptoms of this disease is that the urine of the little patient exhales an abominable odour, like that of a cat. The sooner the urine assumes this smell, the sooner the crusts dry and fall off, and on the other hand the disease is protracted in cases where this fetid odour does not occur.

257. M. Strach,* who has written with much precision and clearness on this disorder, and M. Haase who has confirmed his assertions, have announced, after repeated trials of its efficacy, that the violet,† *jacea tricolor*, sive *trinitatis flos*, cures it perfectly and promptly, without danger and without unpleasantness to the child. The recent or the dried leaves of the plant are employed and in the following manner.

258. A handful of the flowers are boiled in milk, and this is given to the child night and morning; or better, the leaves may

* *De crusta lactea infantum, ejusdem que remedio specifico.* Frankfort, 1779.

† *Viola tricolor.* Erlang, 1778.

be dried in the shade and powdered: a half drachm of this is infused for two hours in some milk. Then this is boiled and passed through a sieve; the child drinks of it twice a day, once in the morning and once in the evening, so that it takes a drachm of the powder a day. It may also be added to soup or panada, as the violet does not sour the milk nor alter its agreeable taste.

259. By the use of this remedy for eight days an eruption of many pustules is produced, even in children who before had little or none. All the face is covered with a very thick crust, (of which it is well to fore-warn the parents.) If the urine has had no odour up to this time, it now assumes the offensive one of which we have spoken. (256) This drink is continued until the disorder is fairly out. When the eruption is complete, the crusts thick, and the skin sound beneath them, they fall off, generally in large flakes, after the second week, leaving the skin without any mark. Although this may have occurred, it is necessary to keep up the use of the remedy, in order to eradicate all remains of the disorder from the system.

260. During this treatment we give no purgatives unless the primæ viæ be disordered. There is ground to believe that purgatives might interfere with the complete depuration of the achorous poison and its diminution by the skin. We know that this is accomplished when the skin is soft and firm; the face no longer swollen, and the urine healthy and natural.

261. The violet (*pensie*) succeeds so perfectly against this disorder that when it fails to cure, it is said by observers, that it must be the fault either of the physician or the nurse. It is the fault of the physician if he neglects to remove the complications that attend it; especially, if he does not remove by purgatives the mass of mucosity that clogs the primæ viæ. It is the fault of the nurse, if having been diseased previously, she communicates it to the child as fast as the remedy removes it. If this be the case the infant must be weaned or the nurse changed.

262. Since the achorous disorder is communicable, it is of great importance to ascertain if the mother or nurse has previously been attacked with it; because this information may enable us to prevent the outbreak of hereditary disorder, or infection from the nurse.

263. We may know that a woman has been diseased in this way, if the skin of the face be more free of hair than is usual; if the cheeks have lost their down and present a shining appearance; if the skin of the face be far whiter than any other part of the body; (from this effect is derived the vulgar opinion that this disorder beautifies the complexion;) if the cheeks, when reddened by heat or any other cause, appear scarlet instead of rose colour or carmine, and if this redness instead of being shed uniformly, forms large spots separated by white spaces.

264. It results also from observations carefully made upon this subject, that the disease may remain for a long time in the system without being developed; that it can without any eruption, occasion disorders, such as mesenteric obstruction, ophthalmia, blear eyes, purulent discharge from the ears, and marasmus. We may ascertain by the following signs whether a child which is not apparently affected by *crusta lactea*, is nevertheless sick from the influences of the poison that produces it.

265. The visage of the infant, is more full than it usually is when fat. The cheeks and mouth are swollen and round. The cheeks have not their rose colour but an intense red which extends from the superior angle of the cheek to the lower jaw. The skin when touched by the finger is hard as leather, and you cannot wrinkle it, a fact which pleases the parents who are proud of a child so plump. The epidermis, in the places distinguished by red spots, is rough, and feels as though little scales were elevated above the surface. The infant rubs its face on its pillow or the dress of its nurse, and finally the urine has its characteristic disagreeable smell.

Such are the signs, the symptoms, and the treatment of the achorous disease of infants.

266. M. Fischer, who has had occasion to treat this disease in adults, not being able to procure the violet, has substituted the following treatment, which I ought to mention here, to facilitate a parallel case, and to point out a new resource in difficult and refractory cases.

This physician prescribes every evening, in water, a grain of the golden sulphuret of antimony, as much calomel, and a scruple of prepared shells, mixed together. He administered also, morning and evening, a tea-spoonful of the extract of *cicuta*, as prepared

by Storch, dissolved as follows. A half ounce of this extract is to be dissolved in six ounces of mint water. The dose is a teaspoonful, night and morning.

He employed, shortly after, lotions of the face made of two parts of camphorated wine, with one part of vinegar, treated with litharge, (white oxide of lead;) but he soon added to this a liniment composed of six drachms of white precipitate of mercury, and three ounces of the 'unguentum rosatum,' scented with a few drops of the oil of jessamine.

The use of rich food, pork and geese, were interdicted. He was permitted to drink pure wine at his meals. He was directed to play at tennis, to walk in the open air, and three or four times a week to wash his feet in cold water.

Six months were necessary to complete the cure of this very obstinate cutaneous affection, and it was not until the end of two months that any marked relief was observed.

267. According to my own observation I believe that the use of the nitric lemonade, internally and externally, and that of an ointment composed to the extent of an eighth part, of the white oxide of mercury, which is so successful in the removal of blotches and pimples from the face, would be found useful in the crusta lactea of adults.

7. Of Cough and Pulmonary Disease.

268. Cough is not an uncommon attendant upon dentition, but when this symptom is severe, the eruption of the teeth is observed to be difficult and tardy.

Cough is very inconvenient in dentition. It causes congestion of the head, enfeebles the lungs and disposes them to engorgement, and even impairs the digestive apparatus, and often gives rise to bad complications.

269. The most common kind of cough at the period in question is of a nervous character; it depends upon the irritation, pain, and inflammatory condition of the gums. It has so completely this character, that Fredrick Hoffman has seen it resist all remedies and continue unabated until the appearance of the teeth. The accumulation of blood and humours, the effect of long continued dentition, commonly takes place in the parts about and above the jaws, but sometimes it falls in the parts below, particularly in the

lungs, and hence arises another kind of cough proportioned to the amount of engorgement and the quality of the fluids which cause it.

Hoffman, whom I have just quoted, mentions a very severe cough in children whose teething was difficult, and he regards it as an indication of serious results. The nervous or humoral is dangerous not only on its own account but because of its secondary effects. There is another kind which occurs at this period, which is gastric; being occasioned by acid, putrid, or glairy matters in the *primæ viæ*.

270. The difficult respiration arises from one of the causes just mentioned; (269) and the naming of these causes indicates the mode of combatting them. When irritation and inflammation are propagated to the bronchia, and the substance of the lungs, the symptoms are redness of the cheeks, cough so painful as to cause the child to cry, a hot dry mouth, fever and painful respiration. Unquestionably the child should be bled if we do not wish it to die of pulmonary inflammation.

271. The propriety of bleeding children in the maladies of dentition has often been called in question, and the advice I have given may appear strange to those who dread the loss of a drop of blood from patients so feeble, so mobile, and so apparently unable to sustain the abstraction of it. Nevertheless this practice is recommended by the most weighty authority, and I shall have occasion to revert to its utility. Nothing can be substituted for it, and it cannot be dispensed with in many cases of infantile disease. When the lungs suffer from irritation, and when there is a dry sonorous cough, or when the cough, though moist, brings up nothing but a gelatinous, whitish substance, we ought to conclude that the child is menaced with pulmonary inflammation, or at least with a formidable congestion of the respiratory organs. The lungs contain naturally a large amount of blood, and to despise the alarming symptoms which advise us of its congestion, is to expose our patient to acute pneumonia. When it is said that very young children are not liable to inflammatory disorders, all experience is contradicted; autopsic investigations also prove the contrary.

272. Thus cough and dyspnœa are among the accidents which it is necessary to treat with the utmost skill. After bleeding,

humid vapours directed into the mouth give great relief. These vapours are useful to the gums, throat, and bronchia. Mudge has boasted of them as the most important of all remedies for the removal of cough.

A wise use of narcotics, externally, that is by friction, is of great use in the treatment of diseases of children, and in many instances I have succeeded by this means in suspending the cough and diminishing the dyspnœa or the distress dependent upon irritation of the bronchia and engorgement of the lungs. The method I employed was to rub the internal and upper part of the arm, the parts beneath the lateral and upper part of the thorax, and even the side of the neck with a half drachm of laudanum mixed with water, or wine, or brandy, according to the degree of effect I wished to produce. These frictions which are frequently repeated in the twenty-four hours, if necessary, often render much internal medicine unnecessary and often produce a sure and important effect. When the cause of the cough is of a mixed character, that is to say a combination of the nervous with the humoral, a blister upon the back is most beneficial.

273. When the cough is evidently gastric, which is known by the want or little intensity of fever, by the predominance of gastric symptoms, such as the indolent swelling of the epigastrium glairy stools, &c. but above all by information of dietetic errors, and by the evidence of painful digestion, there is no better remedy than an emetic, although it somewhat distresses young children. Fothergill's prescription in such cases was tartar emetic and crabs' eyes, given in small doses, until the purifying and tonic effects of the tartar emetic could be obtained.

8. *Of the Sleeplessness and Sudden Alarms of Infants.*

274. We cannot reflect upon the state of the system in difficult dentition without seeing that children under such circumstances must suffer and manifest their suffering by sleeplessness, restlessness, and sudden alarms, which rouse them from their slumber. The nursing child sleeps much: its slumber is long and tranquil. Sleeplessness therefore indicates disorder in its system and gives reason to fear the most serious results. Thus as soon as a teething child has much difficulty in getting to sleep, through the uneasiness of dentition, and when on quitting the cradle the easy

and regular movement of which suspends its cries, it awakes to cry, its nervous agitation is already great. And why should it not be so? Habitual irritation, according to M. Tissot,* though it may be but little apparent, keeps the nervous system in such a state of mobility, that the slightest cause becomes a powerful stimulant. It is thus that in headache and in gout, or in any painful disorder, patients are so irascible and so impatient of noise, light, the presence of many objects, &c. All the nerves, their sensibility being morbidly increased, become incapable of sustaining even feeble impressions. It may be said with truth that pain electrifies the nerves and develops an excess of sensibility, and painful dentition may be considered an essentially nervous disease.

275. Sedatives, anodynes, and narcotics are the proper remedies for this condition. (274) They ought however to be preceded by purgatives, because these little patients generally suffer from a disordered condition of the *primæ viæ*. When the indication drawn from this fact, is fulfilled, we must try to obviate the second. Physicians have recommended for this purpose the calming powder of Stahl; others prefer the nitrated camphor; theriac and diacodion syrup, are the anodyne remedies chiefly employed. Perhaps the extract of wild poppy heads would be more certain; opium and its different preparations possess more decided virtues. I have mentioned the anodyne coral powder of Helvetius. M. Lorry recommends a watery infusion of opium, to which he ascribes all the anodyne without the narcotic powers of the drug: this preparation is described in the memoirs of the Royal Society of Medicine of Paris, as the water of opium; but it is not preserved as officinal. Laudanum diluted with water or wine is used advantageously every day. It is hardly necessary to observe that physicians should be cautious in administering opium to young children, though it is true that while suffering pain, the system bears larger doses than at other times. It must also be born in mind that opium constipates the bowels, and children in dentition require free evacuations.

276. It is advice more important than may be supposed, not to treat lightly the sudden frights which break the rest of the children, and cause them to awake with cries, which are not easily appeased.

* Treatise on the Nerves, vol. ii, part 2, page 199.

This symptom is often the precursor of convulsions, eclampsia or epilepsy, and we know how much spasmodic affections of this kind impede dentition, how much they increase the mobility of the system, and how often they endanger and destroy life.

277. To prevent these serious results we must combat the accessory and sympathetic causes, before we attempt to relieve the nervous disorder. According to these general considerations we must take blood by leeches where there is sanguine congestion, vomit with tartar emetic or ipecacuana, or purge when it is necessary to cleanse the *primæ viæ*. Warm bathing every day or every other day, and the administration of antispasmodics, the best of which perhaps is the oxide of zinc before mentioned, are also useful. The oxide of zinc, known since the time of the empiric Luddeman as the flowers of zinc, a medicine whose powers have been denied and exaggerated, succeeds very well in the convulsions of children; it calms the nervous system in a different manner from narcotics. M. de la Roche, after having witnessed the use of it declares that he never knew it to fail to procure a perfect cure when the convulsions depended altogether upon a cause purely nervous, and not upon organic change in the brain or disorder in the intestinal apparatus; and the same gentleman says, that when this medicine is given at night in gradually augmented doses, beginning with a fourth or a third of a grain, it acts most happily in calming the nocturnal alarms and the frightful dreams to which so many children are subject, and which are often the precursors of incurable epilepsy. I will here state some cases in proof of what I have just said.

278. The daughter of a countryman was brought to me in January, 1780. She was ten months old: had four incisor teeth and was affected with a trembling of the arms, which returned at short intervals. This condition had not existed for eight or nine days. Her teeth were very much swollen, at the place which corresponds to the small superior molars. This child was very restless, slept badly, with frequent interruption from convulsive movements and sudden frights. Besides this, it had suffered for three weeks with a diarrhœa, which occasionally poured out serious and greenish matters. I purged the child three times, with the interval of a day between the doses; twice with magnesia and jalap, and once with the syrup of rhubarb and succory. But the

nervous condition was not at all improved. Then I had recourse to the sublimated oxide of zinc, in the dose of a half grain suspended in a spoonful of rice water. This dose was repeated four times a day and doubled on the next day. At the end of five days the trembling had ceased and the nocturnal alarms did not return after the eighth day. Nevertheless the use of the oxide was continued for three or four weeks; the child recovered and cut its teeth without accident.

279. A child, 19 months old, was on the evening of the 10th of May, 1780, playing in the street at a short distance from its nurse, when an ass loaded with faggots knocked it down rudely on the pavement. It was only scratched but being much terrified it cried loudly; it was taken to its mother who endeavoured to quiet it. Still trembling, it sometimes quit the breast to cry in its infantile way, that it was afraid. In the succeeding night it awoke twice and manifested the same fright; but was again lulled to sleep. Its mother remarked that its sleep was agitated and its arms lifted from time to time. At length at seven o'clock in the morning, she heard the child cry, ran to it and found it insensible and in convulsions. I was sent for. When I arrived the convulsion had subsided, but they said that the flesh still quivered. I ordered the sublimated oxide of zinc. It took a half grain every three or four hours: which I thought the more proper as it was about to cut the second two small molars, and had before displayed some slight difficulty of dentition. The use of the zinc appeared to remedy all these accidents and it was continued until the eruption of the teeth.

280. The child of a baker, at the age of 25 months, had all its teeth except the two last molars of the upper jaw, from which it had been suffering much for fifteen days. Dentition however had not been laborious and the child always appeared to have a good constitution. Nevertheless it had fallen away, and become peevish and a diarrhœa of yellowish and greenish matters afflicted it. During sleep its tears or almost constant agitation prevented us from ascertaining whether these movements were of a convulsive character or not; but in the little time that its sleep was sound we could perceive convulsive agitations in the muscles of the face and the tendons of the fore-arms. What chiefly alarmed the mother was the sudden starting from sleep and the trembling movement.

I was consulted: After some general remedies, such as the warm bath, two purgatives and some soothing drink, I employed the oxide of zinc. It had the same success that I had met with in the preceding cases. The disordered action of the nervous system yielded to the powers of this antispasmodic, and the teeth appeared without any unpleasant symptom, except the uneasiness which always attends eruption of the molars.

9. *Of the Fever of Dentition.*

281. The fever of dentition may be acute or chronic, moderate or ardent; ordinarily the chronic variety is but a degeneration of the acute. This fever is sometimes essential to or dependent upon the painful state produced by dentition. Sometimes it is only an accident or result of many different causes which complicate and impede the dental eruption. This general remark should be always kept in mind. The more essentially fever belongs to dentition, the more its character and symptoms are nervous; the more it depends upon complications, the more it is inflammatory, gastric, or putrid.

I am about to describe that which is most commonly met with in practice.

282. The fever of dentition is made up of an acute remitting fever and of an inflammation of the gums, either slight or considerable. The state of the pulse* is an index upon which less dependence can be placed than upon other symptoms. The skin is dry and hot, indicating the erythysm of the organ which produces two principal effects. 1st, to hinder cutaneous absorption and transpiration. 2d, to throw back a quantity of blood and humours upon the internal parts. From this most generally results difficult and painful respiration. The hypochondriac regions and the epigastrium are burning hot, so that if the hand be laid

* Doctor Heberden has noted with exactness the modifications of the infantile pulse, and according to his observations the pulse of a new born child beats 130 or 140 times in the minute. (He observes very properly that the pulse must be examined while the child is asleep as the least thing accelerates it when the infant is awake,) in the first month it beats 120, never less than 108 times in a minute; during the first year 108 to 120 times: in the second between 90 and 110: and it maintains this frequency until the sixth year. Medical Transactions, vol. ii.

upon them a sense of burning is produced which continues several seconds; this heat gradually subsides and is succeeded by chilliness: drowsiness and incoherent babbling sometimes follows this: undoubtedly in consequence of the capacity of the blood vessels of the brain and the volume of that organ in infancy; circumstances which facilitate congestion.

283. During this state of coma or lethargy, convulsive movements or at least involuntary agitation of the limbs are common. Those who are in the habit of watching this disease are well aware that the thumb, the great toes, and the lips are particularly liable to be thus affected. A sort of sardonic laugh is also common.* The bowels at first are constipated and then the symptoms are most violent. Soon, however, they become loose and the dejections are liquid, yellow, green, or mixed with yellow and green, with glairy matters, and albuminous flocculi. The odour is sour or putrid, or of a peculiar animal kind. Sometimes severe colic precedes these passages. These are announced by the sharp cry, which not being long continued, shows the suffering to be of an interrupted, spasmodic character.

284. If the constipation continue, the face swells, the heat is more intense, the stupor more profound, and therefore more dangerous,† the convulsive movements more imminent, and when they come on, more violent and frequent. The passage of urine is irregular, children sometimes pass twenty-four hours without micturating; so violent is the erethism, that it suppresses secretion and has caused authors to suppose that all the fluids are driven to the head. The urine is first clear, and sometimes very abundant, and it is a fact that this sort of diabetic discharge, prostrates a child as soon as colliquative diarrhœa. The limpidness of the urine, which is always an unpleasant sign in fever, is still more so in infantile subjects, as the secretion from their kidneys is usually thick, sharp to the smell, and sometimes whitish, from the action

* Does this sardonic smile, observed by Van Sweiter, Camper, and Barthey, depend upon the communication of the suborbital branch which sends a filament to the commissure of the lips, with the palatine branch which is distributed to the teeth of the upper jaw?

† Teething children that appear tranquil and sleep soundly are greatly threatened with convulsions.—*Hippocrates de Dentitione.*

of benzoic acid, or perhaps from the dissolution of the cheesy matter of the milk.*

285. To these general phenomena are added others that belong to the mouth, and adjacent organs. The mouth is hot and dry; the gums swollen, sensitive and painful: thirst is manifested by the looks of the child and a sort of ruminating movement; the patients drink or suck greedily, but only by starts. The teeth already cut become dry, lose their whiteness, or present a sallow aspect. The gums also have an unpleasant darkish colour; and finally the countenance is unequally animated, the eyes suffused, &c.

286. When the fever of dentition is more humoral than nervous, the inflammatory symptoms of the mouth predominate more or less strongly, over the fever. The phlogistic state of the gums is very remarkable. They are swollen, hard, and livid, and when touched return a sensation of pulsation and great heat. The tongue is dry and red. This redness is especially very remarkable on its edges and at its points, and is shown plainly by the livid colour under the tongue, and the white or darker colour of the parts above. Aphthæ fix upon the internal parts of the cheeks, the sides of the tongue, and even the palate. The eyes are red and intolerant of light, and they pour out a sharp and hot serosity. Sneezing sometimes is frequent, and at intervals there is a gnashing of the gums or teeth. The cheeks are swollen and glistening; the cough is fitful. The discharge from the bowels is green, serous and debilitating, or there is obstinate constipation requiring fre-

* The annals of medicine, No. 163, page 64, art. 13, record a singular case of remarkable urine, discharged by a young woman of twenty six years of age, who had been some years a widow. The secretion in this case was white as milk, a little thicker than usual, of an odour and taste much like that of ordinary urine. Analysis discovered that it owed its odour and other physical qualities to the principles naturally contained in urine, and its colour and milky opacity to pure, cheesy matter, held in solution by it. This phenomena was very remarkable in a woman, whose breasts did not contain a drop of milk; but taken with others, it goes to show how much living bodies are subject to physical and chemical laws, and how much these laws demand attention in physiological and pathological inquiries. Medicine owes its progress not so much to the accumulation of simple facts, as to discussion upon them, and the results which strong minds have deduced from them. The phenomena are less curious than their cause, and the investigation of causes is far more important than the observation of symptoms. "*Si suffecerit medicus ad cognoscendum, sufficet ad sanandum.*"

quent purgatives. Sleeplessness is masked under a kind of lethargy; convulsions are stronger and more continuous; hiccough manifests itself; the inflammation of the gums and the aphthæ run down to a gangrenous condition; the child will no longer take the breast, and has no strength to cry, which as Harris remarks is one of the worst symptoms of the disease. Finally paralysis of the eyelids and iris succeed, complete coma follows, and the child dies.

287. The fever of dentition is always serious of itself, because it is not lighted up until the lesions of the mouth are carried so far as to affect the whole system, or when morbid causes anterior to the dentition occasion dangerous complication. Whatever be the progress of this fever, it is desirable that the heat and thirst be moderate, that drowsiness be not so great as to render the child insensible to the uneasiness and pain of dentition; that there be no aphthæ, or that they be few and white, not brown, dry or black; that there exist a proper degree of salivation; that the bowels be rather loose than constipated; that the dejections be not excessively crude, very serous, intensely green, but rather yellowish, slightly thickened, and of little smell; that there be occasionally sound sleep; that the child sucks or drinks freely; and finally however quiet it may have been hitherto, that it should cry and be restless. Such symptoms are favourable.

288. There is not the least room for hope when the mouth becomes gangrenous, when the aphthæ degenerate and spread; the teeth become black and greasy; when the child refuses to suck, swallows with difficulty; returns liquids by the nose or by the mouth, is constantly convulsed, and having the pupils of the eyes turned under the lid, shows only the white part, &c. If after looseness, the diarrhœa suddenly stops and swelling of the abdomen takes place, especially if it be painful, the danger is imminent and death at hand.

289. Nevertheless, the fever of dentition is not always immediately dangerous. The symptoms sometimes daily abate in intensity and the fever becomes slow or chronic. We have given an example in 210. In this condition digestion is very badly performed, marasmus progresses daily, and the child draws gradually nearer to the grave. When the fever assumes this character, and when the child has arrived at the state of meagre-

ness of which we have spoken, we observe that the pain of the gums ceases to affect it. These parts partake of the general atony into which all the body has fallen, so that we may press them with the finger without causing any manifestation of pain in the child. The teeth, which owing to the great diminution of the vital strength, make no progress, do not press forcibly upon the gums, dentition is suspended, and the child dies of the marasmus caused by the slow fever.

290. The treatment of the fever of dentition is not difficult to be understood, but it is hard to pursue. We have to do with little patients who cannot reason, and to whom the violence or constraint necessary for the administration of remedies sometimes produces great injury. I have seen children throw up medicine as soon as it was given because force had been employed in giving it. A child, naturally of a violent disposition, to which a dose of manna and syrup of peach leaves was forcibly given, died during the operation of the medicine; doubtless from the effects of the rage in which it was swallowed. Such cases have given rise to the essay of Fredrick Hoffman, "*De medicina emetica et purgante post iram veneno.*"

291. This consideration ought to cause physicians to insist upon external applications, such as baths, fomentations, liniments, frictions, enemata, blood-letting, leeching, &c. and to cover the unpleasant taste of internal medicines by syrups, &c. Thus we may fulfil the indications of fever without neglecting to indulge the dispositions, repugnances, and even caprices of children.

292. Baths, fomentations, and injections are principally useful when the fever is high, the skin dry, and the bowels constipated; when in short, erethysm affects all the organs of secretion, though there is still more of spasm than inflammation. By baths and fomentations we soften the skin, lessen the temperature, prevent inflammatory engorgements, and dispose the economy to the necessary evacuations. By the aid of injections we bathe the intestines, prevent puffy swelling, re-establish the loose discharges from the bowels, render the fever more regular, and prevent the disorders so fearful in dentition.

293. When the mothers are timid or prejudiced, fomentations may be substituted for baths, though they are far from being so useful. These are made with pieces of flannel steeped in emol-

lient decoctions, with bladders half filled with the same, or with heated bricks plunged in water, and then withdrawn and wrapped in a cloth. Placed at the feet, the steam produced by them exerts a salutary relaxing effect.

294. The injections are composed of decoctions of emollient and laxative herbs, such as mallows, the wall pellitory, the acanthus and similar plants, with flaxseed, bran, &c. These injections are given warm and are repeated every day according to the degree of fever and the necessity of relaxing the belly and removing the acrid matters which according to the observation of Quesnay, may produce an ardent stercoral fever.

295. Bleeding of which I have already spoken advantageously, contributes more directly still to combat the fever of dentition and prevent convulsions. Physicians are generally timid with regard to bleeding nursing children, and those suffering the disorders of dentition, and yet in these cases inflammations are to be subdued, violent spasms to be relaxed, and a dangerous condition to be relieved, because it will not admit of long continuance without destruction of life. It is true that the wishes of parents, and the current of prejudice is against it, but the true physician will not permit himself to be over-ruled. Good practitioners have testified that there is no more powerful means to disarm the accidents of dentition, and Sydenham ranks it above all the boasted specifics of cure. He found nothing so powerful in relieving the pain and the convulsions that are caused by it. In the odontalgia of adults, and in those inflammations of the dental apparatus to which they are sometimes subject, they may be bled with great advantage and without bleeding suppuration is generally the sure result. Can children, more irritable and more liable to nervous disorders, suffer engorgement of the gums, without being menaced with greater evils, if we have not speedy recourse to bleeding, the most powerful of all antiphlogistics? Levret, who had great confidence in it, has remarked that a table-spoonful of blood, was equivalent for newly born children, to eight ounces for adults; that is to say as one to sixteen or thereabouts; and this rule may be taken as a basis of comparison. Nevertheless, in spite of the advice of Levret, who prefers bleeding from the arm, of Paros, who prefers to take it from the feet, and of others who

take it from the arm while the feet are placed in warm water, it is better to bleed children by leeches than the lancet.*

296. Harris, who has long been considered good authority in infantile medicine, preferred leeches to the lancet in these cases, and Tralus has proved from reasoning and experience that the effects of their application are more sure than those of the lancet.

The restlessness of children, the smallness of their veins, the difficulty of ascertaining the amount of blood necessary to be taken, all conspire to render the use of the lancet difficult, besides the feebleness of their constitution makes them little able to bear this sort of depletion. The use of leeches avoids these difficulties. Armstrong, Underwood, and Alphonso Le Roy, have adopted them and have proved their great utility in many critical conditions in which dentition may give rise. In general they should be applied behind the ears, when they are employed to assuage the pain of teething and the effects arising from it.

297. Blisters and friction with tincture of cantharides are very highly recommended in infantile medicine, because children are very mucous and lymphatic, and their disorders are often founded upon this natural condition. But this circumstance has led to much abuse of these topical applications, in the first stage of the fever of dentition. In fact one of the first symptoms is some degree of drowsiness, and physicians who are in the habit of treating symptoms only, as well as the mothers and nurses, immediately apply vesicatories. These are placed behind the ears or neck, sometimes on the arms and legs, and occasionally, though rarely, upon the thighs. In many cases these applications increase the distress and the fever and add to the irritation of the gums. These effects, however, are generally attributed by the physician not to the mal-treatment, but to the natural tendency of the fluids to the head, which they suppose to be a characteristic of the infantile economy. This tendency however, never has been proved, and facts, when they shall be accurately observed and well com-

* We commend these remarks upon blood-letting to the reader. They are needed in our day. We agree perfectly with the author with regard to the necessity, safety and power of this remedy. But we differ from him as to the general preference of leeches to the lancet; except in very young infants, we think the lancet is decidedly preferable.—*Trans.*

pared and examined, will show that there is no foundation for this opinion.

298. Nevertheless, blisters are useful in the fever of dentition. They may be used even in the early stage of the disease, when its character is nervous, or typhoid, or humoral, in lymphatic and mucous constitutions. They are also serviceable where a cutaneous eruption existing anterior to the fever, becomes pale, and disappears under the effect of it, and finally in all cases where it is likely that the pain and irritation of the gums might be alleviated by the primary or secondary effects of vesication. This last indication however, is less certain, and less important than the others. In the second stage of the fever, topical stimulants are more proper, and blistering is most indicated when the gums become indolent, the mouth less hot, and when without stupor there is irregularity in the functions and in the vital powers. If the slumber be light, if there be much restlessness and a considerable degree of heat, blistering will not be proper; on the contrary a plaster of opium and camphor applied to the soles of the feet may be very useful. When the morbid sleep is profound, and the irritability is slight, blisters may be used with very great advantage.

299. In prescribing for infants it is necessary to choose sweet and pleasant preparations, such as loches, and mixtures, when such forms of administration are admissible. Loches may be easily made with water, and a little gum arabic, or gum adragant, which contains some principles proper to animals, and sugar or syrup. Mixtures are prepared by suspending in certain liquid preparations the medicine we wish to administer. Our remedies in these cases are generally emetics, purgatives, absorbents, or tonics, according to the peculiarity of the case.

300. Is emesis really useful in the fever of dentition? If we look no farther than the state of the gums, the dryness of the mouth, the heat of the body, and all the symptoms that proclaim irritation, pain, and approaching convulsions, vomiting appears likely to do more harm than good. Indeed emetics are not proper in such cases, even when the primæ viæ contains some vitiated matters. But when the fever is moderate; when there is reason to suspect the existence of glairy and mucous matters in the stomach, and when from this circumstance, together with a certain languor in the vital acts, we infer that there can be no

danger of irritating the nervous system too greatly, nor of augmenting the engorgement of the different parts of the mouth, then we may give emetics with great advantage. The syrup of ipecacuanha or a little tartar emetic, amalgamate the best with the loches and mixtures of which I have spoken.

301. The use of purgatives appears more proper in the fever of dentition, because a moderate looseness of the bowels is an eminently salutary evacuation at this period. But this notion may lead to abuse, and indeed often does so, by impeding the progress of dentition; for in proportion as it enfeebles the system, it augments general or local irritation. Puffiness of the abdomen and even suppression of the alvine discharges, have been seen to result from the improper administration of purgatives, and I have known pretenders in medicine to continue the use of manna, almond oil, &c. under these circumstances, upon the ground that they were mild laxatives; when in fact these were the least proper of all to be administered. Rhubarb, jalap, Kermes' mineral calomel, magnesia and castor oil are more appropriate. Syrup of peach leaves, compound syrup of roses, succory, &c. are in common use as purgatives for infants, and commonly answer very well.

302. We cannot expect much from ptisans in the treatment of infants. They drink but little, and unless these preparations be taken in large quantity they are useless. Nevertheless, occasionally these little patients are tormented with thirst amounting almost to hydromania. The quality of their drink seems to make little difference to them; their only demand being for fluids. This great thirst rarely exists without being attended by purging, and the quantity of drink taken is very well calculated to cause diarrhœa, or to maintain and render it excessive. It thus becomes enervating, and even worse, for it is attended by internal inflammation which may result in marasmus. In this case* is not the

* The purging here mentioned consists of the discharge of a white matter, more or less serous and very fetid. In some cases it appears to be of a cheesy character, in others mucous, in others a kind of mucous and albuminous matter in a state of putrefaction. But this is not milk coagulated into cheese and thrown off by digestion, for it occurs when the child takes no milk. The thicker it is, the more dangerous the disorder. At each dejection the child is more prostrated. The stomach loses all its power. Food is hardly received before it excites purging; nausea succeeds, with efforts at

gelatino-albuminous diarrhœa a critical or critico-symptomatic purging, but only the effect of irritation and aqueous engorgement of the primæ viæ, which should be checked or even suspended by means of acids or astringents as the case may require.

I have narrated different cases of the morbid thirst or hydromania, when describing the acute autumnal fever of infants in my treatise on convulsions, second edition, page 192. I will observe that this hydromaniacal symptom sometimes depends upon an erythematic state of the mucous membrane of the stomach and intestines.

303. Absorbents and alkalies are less advantageous in the fever of dentition than in acid indigestion and the colics which ordinarily proceed from it. When it becomes necessary to employ them during the course of the fever, pure magnesia exercises a purgative, absorbent and antacid power. There are cases, in which the fever being much reduced and acids continuing to irritate the organs of digestion, it becomes necessary to strengthen the intestinal viscera by destroying the acidity of the primæ viæ. In such cases Camper and Schlosser prescribe a little chalk water in soup or milk or a few grains of almond or other medicinal soap, and they thought these remedies to be very energetic in relieving the morbid condition in question.

304. If the acute fever of dentition is spasmodic, nervous, and inflammatory, the chronic fever is asthenic or adynamic in its character. The indication that this presents is evidently to support the vital strength. This may be accomplished by good nourishment aided by tonic medicines. Among these last are quinine, cascarilla, serpentaria, and that which is often better, the cassia lignea, or even cinnamon. Children bear alcoholic tinctures very well; and those of myrrh, castoreum and amber may be used with advantage.

vomiting, in which the child seems about to expire. The more we give farinaceous aliment and mild soothing drinks, the worse the symptoms appear. No fever accompanies this condition. This purging, called white by Le Roy, is a chymic diarrhœa, the cœliac of practitioners

The author we have cited proposes no remedy but dry and well seasoned aliment, the juices of meat, roasted meat, good wine, quinine, &c. Soups, and vegetable and humid aliments must be proscribed. This treatment may be modified, but the principle must be maintained.

305. To cure the fever of dentition it seems at first sight that the eruption of the teeth must be accomplished; but this is not always necessary. We often succeed by good management in removing the complications and then dentition is readily and safely effected. There are however, some cases, fortunately they are rare, in which the fever does not yield until dentition is completed. These are cases in which the division of the gum and extrication of some tooth is necessary. But as I must return to this important point, I will not recapitulate here the details I have already given, (210, 212,) but I will reserve any further remarks for the article that I intend to devote to this particular matter.

306. Convalescence from the fever of dentition merits some attention. The organs of digestion have ordinarily suffered during the course of the disorder. It is necessary to pay attention to them even after fever and its attendants have disappeared. Good regimen, the continued use of some tonics, dry frictions, stomachic applications, these are the resources to be relied on in such cases. In the convalescence from this fever, an appearance of crusts, of pimples, or of tetrous eruptions, is not uncommon. These critical occurrences should be carefully watched. They require some purgative medicine and the use of the medicines recommended against *crusta lactea*.

10. *Of Convulsions.*

307. Almost all diseases of children occasion convulsions, strictly speaking; that is to say, involuntary movements of the organs of motion. These may exist either with or without cerebral lesion; in the first case they constitute eclampsia or epilepsy; in the latter, convulsion.

308. All the attacks of this kind which children have during dentition ought not to be regarded as caused immediately by the pain of teething. Some depend upon other causes of a general character, while others are immediate consequences of the painful dentition. They occur in infants extremely irritable; those that abound in blood and fluids, and those that are feeble and exhausted.

309. Although experience shows that certain infants are more liable to convulsions than others, yet it is often only during dentition that such seizures occur, and therefore they inspire much alarm, whether they be serious or not. These convulsions, partial

or general, sometimes occur in the early stage of fever, and sometimes not until it is advanced in its course. The first (partial) are always less dangerous because they appear to depend upon a morbid mobility less intense in its action, than that which can spread its influence over a greater extent of the frame. Nevertheless from whatever source they arise, they are perilous to the infant whenever the convulsive attacks succeed each other rapidly, and especially if they involve the loss or suspension of the intellectual functions. When they depend directly upon dentition, the teeth must appear in order to their removal; nevertheless we may diminish the violence, or even prevent the return by aid of the remedies which allay morbid sensibility, and render the voluntary muscles less susceptible of impression.

310. Convulsions are especially to be dreaded during difficult dentition, because they very much enfeeble the nervous system and dispose the brain to engorgement. Dentition itself is likely to produce this effect, and convulsion increases the disposition. When the nerves are enfeebled by convulsive shocks they are more easily affected by stimulant agents. Thus difficult dentition and convulsions each become both cause and effect in increasing the disorder of this period, and render the fate of the children more critical.

311. When, during dentition, convulsions occur, vulgar practitioners fly to absorbents, purgatives, or potions, or mixtures medicated by tincture of castoreum. These remedies are not the most useful and may do harm. The most useful means are the warm bath, anodynes, and antispasmodics. I have already explained the action and the utility of these means. Camphor triturated with a little sugar, or incorporated with the powder of guttete, in the dose of a fourth or a third of a grain is an excellent remedy. When the *primæ viæ* contain much mucus and the patients are feeble, *assafoetida* produces very great effects. I have proved this by my own experience. It is unfortunate that this drug has such a detestable taste and smell.

312. According to the predominance of certain symptoms the convulsions are not only to be feared, but they require different management and remedies. In general, however, we have to apprehend irritation and the effects of irritation, sanguine or lymphatic congestion in the brain. If the first requires the abstraction

of blood, the second calls for excitants and evacuants. Convulsions from cold and serous engorgement are sometimes relieved by moxa, when they have resisted purgatives and such medicines as cause or increase absorption.

313. It is a common opinion that when the engorgement of the brain is caused by blood, the head is very hot, that the face is red, that the arterial vessels of the head and neck beat with violence, that there is considerable oppression : and that when the engorgement is occasioned by serum or lymph, the face is pale ; there is frothing at the mouth and little action in the blood vessels. It is also supposed that children whose heads are large in proportion to the rest of their body, are in a state of sanguine cerebral engorgement. Observation, however, does not confirm these precepts ; we have seen children die with all the symptoms of lymphatic engorgement, and upon examination we have found all the evidences of sanguineous congestion. The serous effusion that is found in small quantity in the ventricles, cannot be considered as any thing else than the result of the difficulty which the blood experiences in maintaining its circulation, especially in the last moments of life. This difficulty when very great suspends the capillary circulation ; and as the carnation or brilliant colour of the skin depends upon the flow of the blood through the external capillary vessels, it is lost when the blood is congested in the large vessels or in the internal capillaries or in the small blood vessels. The body becomes pallid when the organic forces are oppressed by weight of blood and real lesions of the circulation. Thus sanguineous plethora gives place to lymphatic plethora. When the blood vessels are too distended and too full, they cannot admit the lymph poured into the subclavian by the two great lymphatic trunks into which the different divisions of the lymphatic system disgorge. This sanguine plethora then draws after it a lymphatic and serous one, and he who in practice regards only the latter, attends to a mere effect of little importance to the neglect of the primary cause of disorder.

314. Some physicians having observed how readily children are seized with convulsions through sanguine engorgement, while this condition does not cause apoplexy or palsy as in old persons, have inferred that convulsions do not deprive the patient of sensibility, and that thus we may judge of the danger of an attack of this

kind, by testing the degree of sensibility, by pinching or pricking the skin. This test may be useful, but it is not true that cerebral congestion never causes apoplexy or paralysis in infants. I have seen many children remain palsied after a single attack of convulsion. Some of them do not see during the attack and appear not to be sensible to sounds. Those who die perish of apoplexy, and although the first effect of cerebral engorgement is convulsion, and that this may lessen the faculties of sensation and motion, it is nevertheless equally true that apoplexy and palsy are dependent upon the same kind of congestion : so much so, that it is often impossible to say whether these affections are caused by the shock of convulsions upon the cerebral mass, or whether the convulsion is not an effect of the same cause that produces them.

315. The disproportional largeness of the head shows at first sight a volume of brain so great that we may fairly suspect great activity of that organ, if not sanguineous plethora ; and hence we may infer a morbid disposition in the organ. This remark, however, if too general, may be erroneous. This largeness of the head is sometimes the effect of mucous and serous plethora, and this offers a different indication from the condition we have just described. It is characterized by a certain feebleness of movement, by swelling of the belly, and habitual diarrhœa ; the children carry the head badly ; they are soft and indolent. During slumber the eyelids are almost always partly open, and we can only see the white of the sclerotica ; the head and especially the region of the fontanelle, is deficient in heat ; the children appear rather to be oppressed than to improve in strength ; they are generally fat, and some perish, as the nurses say, "with all their flesh."

316. When the volume of the head depends upon sanguineous plethora, although the visage may be pale through the difficulty in the small vessels, there is a good deal of heat in the body, especially in the region of the superior fontanelle, the mouth, and the hypochondriac region. The heat of the parts of the head designated is very remarkable, and the practitioner should take it into consideration, with this disposition existing, the slightest augmentation of the mass of liquids, which dentition is very likely to cause, may produce convulsion. If warm and vigorous children, especially boys, have few dejections, if they are flatulent, if they

perspire but little, they are disposed to convulsions. These are apt to occur at night, at the approach of storms, and more surely if the nurse becomes heated, and particularly if she has indulged in a little brandy or other spirituous drink.

317. The treatment of the convulsions of dentition depends upon the condition of the system of the infant who is the subject of them. Pain is perhaps the most remarkable symptom of the state we have described. It frequently renders the child restless, depriving it of sleep, and exciting it to weeping and the agitation ensuing upon it. Pain requires baths and anodynes. De Haen, thinks that these last are the only remedies necessary in dentition. If narcotics however be contra indicated, or the mothers object to the employment of opium in any form, we may use alcoholic sulphuric ether, or the mineral anodyne liquor which Hoffman thought so valuable in the treatment of convulsions of the kind under consideration. However this succeeds far better in cases where the tone of the system requires to be gently increased than in others. Musk has been recommended by very good authors. Mead has testified to its value in the treatment of convulsions occurring in the progress of acute diseases.

Dr. Sauker, physician to the hospital of St. Mark, at Vienna, has frequently verified what Wall says of the power of musk in sub-sultus tendinum, and Messrs. Williams and Whytt, have given great encouragement to physicians to use this medicine boldly in the convulsions of dentition. The first named gentleman testifies that musk is as perfect a sedative in the convulsions that occur in violent gout, as opium is in other circumstances. M. Whytt has seen two or three grains of musk, mixed with a little sugar and taken in a spoonful of mint water, arrest the vomiting in dentition.

318. Rosen, balancing the advantages of anodynes and blood letting in the convulsions, and the fever of difficult dentition, gives the following precept. If the child cries constantly, is restless in its sleep, or sleepless, and if the disorder be yet in its early stage, without fever, one or more doses of narcotic medicine may be given without apprehension of danger. By this eclampsia may certainly be prevented, especially if it be repeated once or twice with prudence in cases where it may be necessary to do it through fear of return. But if there be fever, bleeding must be preferred; and leeching is the proper mode.

319. Nothing is more surely established by experience than that we must refuse to employ opium in all cases of fever accompanied by or dependent upon sanguineous plethora, or by a mass of vitiated matters in the *primæ viæ*. Carminati has shown that opium promotes congestion of the brain, and intelligent nurses are well aware that the continued use of this drug, strongly disposes infants to epilepsy, and to fatal apoplexy, as the result of it. As to the effect of opium when the bowels are loaded with putrid matters, every physician knows that it is most dangerous; preventing the evacuation of these vitiated substances, and thus causing them to undergo further deterioration in the intestines.

320. But to proscribe the use of opium merely because there is fever, is to disregard the phenomena of the nervous fevers described by British authors, in which the chief symptoms are the development of morbid irritability and sensibility. These fevers are cured by cooling drinks, &c. the warm bath and opium. Therefore if there is a fever essentially spasmodic or nervous, assuredly it is the fever of dentition. In order not to misunderstand its character, we must examine if the pain have been considerable or prolonged, if the infant be thin, if it be naturally lively or restless; if it do not abound in humours to an unusual extent, in such cases the fever is rather nervous than humoral or sanguine; hence it rather requires opium and free use of the baths than bleeding or purging. The dental irritation reacts on all the nervous system; this latter becomes very sensitive, and we know that there is but one step between excessive sensibility and irregularity of the nervous action. Let young physicians no longer be imposed upon by the opinion of Baglivi, who believing that almost all the convulsions of infants arise from the stomach, thinks that they should be attacked by gentle purgatives and infusion of rhubarb in particular. Many of the convulsions of dentition contradict this precept, which nevertheless is not entirely devoid of truth.

321. The internal convulsion of infants, described by Stoll, and frequent in Germany, is occasioned by constipation and is truly of intestinal origin. Children attacked by it remain almost motionless, their eyes are fixed and half opened, permitting only the half of the whites to be seen. They manifest terror when they are touched, and they remain three or four days in this state, half

stupid, and die if the bowels be not opened, or if frequent spontaneous vomiting does not relieve the stomach. Such cases should be treated with injections and purgatives. From my own experience I think camphor and assafœtida useful in such cases. Camphor in doses of a third or fourth of a grain given every two hours produces good effects, assafœtida is often purgative, especially when administered for the first time.

322. All the convulsions of dentition are clonic, that is to say, the spasms alternate with relaxation. Nevertheless, I have seen a case of tonic spasm from the same cause.

A child, seventeen months old, of a delicate constitution, had already cut its incisor teeth and the two first molars of each jaw, under the influence of attendant circumstances that gave reason to fear very difficult dentition. During the cutting of the two second molars of the superior jaw, after several days of pain and constipation the glands of the axillæ and neck were found to be engorged; the movements of the head and those of respiration were painful, the saliva viscous, and there was an appearance of stiffness in the inferior jaw. I was called. To avoid the threatened spasm, I hastened to purge the child, which being neither hot nor red, nor his countenance brilliant appeared to have no need of bleeding.

The bowels were moved but the state of the jaw was not changed. I used dry friction and baths, and at the same time applied to each temple a small plaster of camphorated opium, and a similar preparation to the soles of each foot. I directed some spoonful of the compound syrup of mugwort, a syrup which possesses considerable antispasmodic properties. Nevertheless, the disorder made such progress that on the ninth day after the tonic convulsion appeared, the mouth remained open and the jaw fixed; the child could neither suck nor swallow; it occasionally gave some deep cries and its appearance resembled that proper to hydrophobia. No means of relief were now left except such as might act through the bowels or the skin. I had recourse to opium in injections, and I gave a grain of it dissolved in some ounces of emollient decoction, every three hours, together with some of the spirituous tincture of camphor. At the same time I employed fumigations with fifteen grains of the black sulphuret of mercury, (cinnabar,) which I caused the child to receive under a

short petticoat, guarding however its head and mouth. At the fourth fumigation which like the others lasted ten minutes, the spasm yielded. There was an abundant evacuation of thick and fetid saliva. The belly being costive, I administered some doses of the syrup of buckthorn and obtained glairy tough stools. Some injections with solution of soap and afterwards with emollient decoctions, seemed to establish the alvine discharge. The child pierced its two molars without other accidents.

323. Thus, convulsions, the most common and often the most fatal of all the accidents of dentition, present different important considerations. They generally proceed from excessive mobility, and the pain of dentition is frequently the exciting cause. Nevertheless, convulsions are not always formidable. Those of the eyes, the face and the arms are sufficiently frequent and not very dangerous. Eclampsia only appears when the affection of the system is very intense or the nervous irritation general, and in all cases the attending circumstances either increase or diminish the danger. It would augur but little acquaintance with medicine to pronounce unfavourably upon a child's condition, because in the course of dentition it may have some convulsive movements or even eclampsia. When the interval between convulsions is long, when the constitution of the child is yet good; when dentition is not tardy and the body not emaciated; in short if there be no great irregularity in the symptoms and march of the disorder, convulsions properly treated need not create much apprehension.

324. An attentive observer may anticipate convulsions and thus provide against them. At the time of dentition, says Hippocrates, children have painful irritation of the gums, fever, spasm, and diarrhœa. These accidents occur chiefly, when the angular teeth begin to push forth in plethoric children and such as are constipated. We ought then to expect convulsions when teething is painful, and much more when the skin is dry, the bowels constipated, and the children badly fed. These circumstances denote that the most important excretions are suspended and that the abundant fluids are about to oppress the vital powers and render them irregular. Then if the children incline to be stupid, if they sleep much and heavily, we ought to look for convulsions. They are near at hand according to Hippocrates, when there is a high fever, when the children besides being constipated do not sleep,

have panic terrors, cry much, change colour often, and have countenances are of a pale greenish, livid, or lively red hue. Finally, convulsions are near at hand when (under these circumstances) grinding of the teeth and trembling of the lips are observed; as Zimmerman states. Fredrick Hoffman considers that children who are born with a delicate temperament, and of parents given to violent passions, are liable to convulsions during excessive and prolonged diarrhœa. I will observe also, according to the father of medicine, that convulsions are much more common when dentition occurs in the summer than during any other season, and relatively to this fact we know that in warm climates convulsions are endemic and severe, and come on from slight causes.

325. In convulsions of this kind, we should bleed freely, open the bowels, bathe the child and invigorate its nerves. Few convulsions treated in good time will resist these means. Bleeding is to be done with leeches; I never use any other mode with small children. As to the invigorating means I advise nothing but camphor, alcoholic sulphuric ether, oxide of zinc, Peruvian bark, or phosphorated ether. If the convulsions attend upon inanition, instead of evacuating and bleeding, we must sustain the strength. The last remedies I have mentioned may aid in fulfilling this intention. I have sometimes seen a mixture of quinine and valerian succeed. Sydenham made great use of hartshorn and recommended it to physicians.

326. Convulsions as well as the lethargy of dentition, may terminate fatally by apoplexy, generally of the serous or lymphatic kind. The post mortem appearances are a sinking or softening of the brain, sometimes engorgements of the pia mater and always an effusion of albuminous water in the ventricles. In the bills of mortality we see many deaths of children under the head of apoplexy, but doubtless among these are a great number who die of acute hydrocephalus.

327. Acute hydrocephalus, whether we consider it as a result of cerebral plethora, or whether it be derived from a morbid affection of the serous membrane of the brain, or whether it be caused by the imperfect absorption of the humor which lubricates the ventricles of the organ, has a close connection with difficult dentition, because no disease has more power to create sanguineous engorgement in the brain, and lesion of the functions of the arach-

noid, and of the lymphatic vessels which open upon the surface of the cerebral cavities. The mode of dropsical formation is now too well known to permit us to doubt these truths. We have seen acute hydrothorax, and lymphatic vomicas to form rapidly in the midst of inflammatory disease of the chest, and whatever may be said to the contrary, there is too marked a difference between the symptoms which belong to slow atonic effusions, and those which characterize aqueous collections preceded by fever, irritation and convulsion, to permit us to confound the etiology of chronic with that of acute hydrocephalus. In the latter there is heat in the head and hypogastric region, vertigo, red and humid eyes, protrusion of the globe, intolerance of light, agitation, muttering, occasional screaming, convulsive movements of the eyes and face, swelling and strong pulsation of the temporal arteries; sometimes numbness in the arm; a peculiar sensibility in the skin of the face; and finally a lethargic condition which changes into coma or apoplexy. This assemblage of symptoms announces a very lively action in the brain. Insensibility and paralysis are the last effects, serous effusion is the immediately fatal cause. Two distinct stages establish in acute hydrocephalus two different indications. The first is that of serous inflammation, the second of dropsical effusion. We cannot prevent the serous effusion except by carefully regarding the age of the child and the nature of the morbid affection we have to treat.

328. The order and object of this work does not authorize me to enlarge here upon the acute hydrocephalus; nevertheless, I cannot refrain from briefly remarking upon some observations upon this disease printed by M. Goudinet, physician at St. Yrieix, in the annals of the society of practical medicine of Montpellier, No. 31, July, 1805. He there records the following case:—A patient, aged 45 years, of sanguine temperament, and gouty appearance, after a severe fall from a horse, fell sick of a disorder which after exhibiting all the symptoms of cerebral inflammation, proved fatal in seven months. Upon examination after death, much water was found in the right lateral ventricle, and a less quantity in the left and anterior ventricles. There were strong adhesions between the membranes of the brain, and a sort of granulation of the choroid plexuses more voluminous than natural. But as the vessels were not varicose, and as no appearance of inflamma-

tion was found, the author concluded that the consequences he observed could not have proceeded from an inflammatory or spasmodic condition of the brain and its serous membrane. If M. Goudinet had reflected that these imperfect inflammations often leave behind them no trace of their existence; that death effaces completely all appearance of spasm; that the affections of the serous membrane and the lymphatic vessels essentially interested in all dropsies, are inappreciable, and that the organic complications of a disorder, rendering it fatal, easily destroy its original characteristics; doubtless he would have discarded the idea that there had been no inflammation in this case, an idea contradicted by the whole train of symptoms and by the adhesion and disorganization of the fibrous and serous membranes of the brain, and especially by the effused fluid which distended the ventricles. Doubtless hydrocephalus internus is a fearful malady of itself, but is it not when it has run its course that serous effusion takes place? When pus succeeds to phlegmonous inflammation; there is no longer distention of the blood vessels, but only a collection of pus; showing that phlegmonous inflammation has been there. When effusion takes place, the affections of whatever kind, that have been present in the parts interested in the inflammation disappear, and we see only the final result of the disease. Thus though effusion in hydrocephalus constitutes a state generally incurable, spasms or phlogosis of the lymphatic structures of the brain, if treated early, may be cured. But then far from considering hydrocephalus as a unit, we must regard the previously morbid state of the lymphatics and serous membrane of the brain; for to describe purulent vomica or empyema is not to give a description of pneumonia, or that phlegmonous inflammation of the lung which has preceded the results thus witnessed; and it is only by curing phlegmon that we can prevent vomica.

As to the rest, are we to cure an erysipelatous or erythematic inflammation of the arachnoid and brain by bleeding in the foot? Ought we not rather to deplete locally by leeching before the deep seated absorbents become involved, and the affected parts disorganized? Richter and Fischer have described an obscure inflammation of the brain which generally has a traumatic origin. When the body is opened we find the arachnoid only, absolutely destroyed by the kind of inflammation peculiar to such structures.

This inflammation progresses very rapidly. Arachnitis, the acute affection of the arachnoid which tends to hydrocephalus may be regarded as analagous. We have much to say against M. Goudinet's opinion upon the nature of acute and chronic hydrocephalus, in the early stages of which we know not what to do unless we can understand the state of the diseased parts; but it is impossible to enter upon these details here. Suffice it to remark that there is great difference between idiopathic dropsy, that which arises from debilitating causes acting directly upon the lymphatic vessels, and symptomatic or secondary dropsy, depending upon inflammation or spasm.

329. There is one thing to which sufficient attention has not been paid, when the children escape convulsions and hydrocephalus which is one of the results, it is palsy. It affects the lower extremities. The children move the neck, head and arms with facility, and often it is not until the swaddle is cast aside that it is discovered that the lower extremities are useless, when the disease is too old to be remedied. I have seen cases of this kind in which tincture of cantharides, valerian, arnica montana, and even the rus radicans, warm baths, saline baths and moxa have all been useless. The muscles were relaxed so that the legs were bent with the utmost facility. The son of M. M****, aged 5 or 6 years, used to amuse himself by kissing the soles of his feet.

11. *Of Aphthæ.*

330. The mucous membrane which covers the mouth œsophagus, stomach and intestines, is subject to a peculiar sort of engorgement or lesion, known as aphthæ, and which though observed among adults, nevertheless is of peculiar importance as a disease of children. To present this subject in a proper light, I have thought proper to mention what the best writers have said about the aphthæ of infants and adults, before examining whether the aphthæ of dentition differs essentially from these eruptions.

Aphthous Disease of Nursing Infants.

331. The aphthous disease of children known under the name of muguet, or millet, or blanchet, is a disease newly observed and lately described, although it appears that Galien and François

Sylvius were acquainted with it.* No authors of the preceding age make any mention of it, and it was at the hospital for enfans-trouvés, (foundlings,) in Paris, that muguet was first observed. Since 1739, it has been a subject of solicitude to the administrators of infant hospitals. Ravlin in France, and Underwood in England, are the first who have given an exact description of it: Messrs. Columbier and Doublet, physicians of Paris, have added interesting details, and those who have taken the prize offered by the Royal Society of Medicine, on this subject, have further advanced our knowledge.

332. The aphthous disease consists of an eruption in the interior of the mouth of small white tubercular points, more or less large and numerous in proportion to the intensity of the disorder. Some have called it the miliary disease of infants, and M. Sanspont, physician at Barcelona, who has observed and written with care, has called it the miliary 'Soda' of children, on account of the burning heat which accompanies it, and which is felt throughout the whole intestinal canal. Ordinarily aphthæ only attacks sucking children; avoiding such as are weaned; nevertheless, I have sometimes observed it in the latter. However it is certainly more common in very young infants. It is very common in hospitals where many children are assembled together, although others who are well cared for, are not exempt. It is impossible to assign the period in which the aphthous cause sensibly developes itself. With some infants its progress is very remarkable, while with others it conceals itself for a considerable time. M. Auvity, surgeon of Paris, who has judiciously considered the aphthous malady, declares, nevertheless, as the result of his experience, that some children have been attacked with this malady as soon as the third or fourth day of their birth; others not until the twentieth day; others again not until the third, fourth, or even the eighth month. We may safely say that aphthæ is a disease of young infants to which they are subject during the period of suckling. It is very rarely that it affects those who have passed this time.

333. The aphthous disease announces itself by the restlessness and cries of the child, which are not easily appeased. It sucks

* Memoirs of the Royal Society of Medicine, of Paris, vol. 9, page 122.

with avidity and seems to be tormented with thirst ; its mouth is hot, and when the hand is placed upon the epigastric region it is found to return a burning sensation. This is what may be called the first stage of the aphthous disorder. Soon the disease progresses, and then the child's mouth shows little white and red patches, but distinct and separate. The thirst increases, vomiting comes on, and the region of the stomach becomes more intensely hot. Some patients are constipated, others have diarrhœa. The stools are serous and mingled with particles of coagulated milk. With some the dejections are dry and mingled with mucosities ; in other cases they are of a greenish black, or take this colour when exposed for some time to the air. The urine, generally, is clear ; the fundement with some, becomes red, and fever appears. This is the second stage.

334. Things going on from bad to worse, there is an eruption of little whitish tubercles occupying different parts of the mouth and not sparing the commissures of the lips ; they appear upon the amygdalæ, extend along the œsophagus, and descend into the stomach and the intestinal canal, even to the anus. Sometimes avoiding the ordinary course the eruption extends even to the superior interior part of the trachea ; a fact which is proved by dissection. Foaming at the mouth and hiccough sometimes accompany the symptoms enumerated ; the children raise plaintive cries, similar to those which are occasioned by inflammation of the bowels. In this lamentable condition the strength wears out, and nature succumbs.

335. The disease terminates sooner or later, according to the activity of the cause, the care of the nurse, and the intensity of the malady which extends to the fourth, seventh, eleventh, and even to the fourteenth day, before terminating either favourably or otherwise.

336. According to the observation of some it seems that the months of August and September are most favourable to the production of this malady. Others state that it prevails chiefly during the summer and autumn. Nevertheless, it appears that in summer, and when the children are scorbutic, aphthæ assumes a slower and more chronic form. When it terminates favourably the redness of the anus extends over the buttocks accompanied with miliary exanthema. It reaches the loins and even the back, and

this eruption terminates the disease. This is the most common crisis, when the disease has not been deranged by bad treatment, and when it runs regularly through its course. But if officious and imprudent nurses, under pretext of relieving the redness of the fundament, apply to it astringent preparations of lead, the most serious consequences may ensue from this interference with the natural course of the disorder.

337. But when the aphthous malady grows worse, nature being unequal to resistance, or remedies failing to arrest the disease, the debility becomes great, aphthæ multiply in the mouth, deglutition becomes painful, the heat of the epigastrium increases, diarrhœa comes on, and death ensues. Sometimes gangrene is the immediate cause of death.

338. This view of infantile aphthæ from descriptions given by the best observers, carefully compared with each other, proves that this disease may assume a highly malignant form, especially in the hospitals, and it is necessary for us to consider it under its different aspects.

339. M. Auvity, numbers among the signs of the aphthous disease, a profound sleep, eighteen or twenty hours before the eruption, during which sleep the eyes are only half closed ; there is agitation of the muscles of the face and lips, difficulty of respiration, prostration of strength and feebleness of the pulse, which indeed becomes almost imperceptible. Then a very deep red colour may be remarked on the lips and the internal surface of the mouth. Slight red spots upon the palate and tongue, which is dry, hot, and a little swollen, indicate, together with the burning heat of the mouth, that the eruption will not be long delayed. One or two white points on the frenum of the tongue, or the gums, at the spot where the incisors subsequently appear, and the gradual acceleration of the pulse give notice of the beginning of the eruption. Its completion is announced by points of the same kind, which at the end of six hours, appear upon the commissure of the lips and the interior surface of the cheeks, and cover more or less, the tongue, lips and gums. In this condition the child is hot and restless ; its countenance is harsh or crisped, and it does not take the breast, nor drink well, which shows that the eruption extends into the œsophagus.

340. The aphthous disease may be distinguished like small pox, into two varieties. In the first the points of eruption are few, and this may be considered the *distinct* kind; it is ordinarily mild. The *confluent* variety generally affords some evidence of malignity, and its progress gives rise to another kind, the *gangrenous*.

341. The aphthous disease is considered distinct or mild when it consists of white large superficial tubercles, separated from each other, with intervals neither unnaturally red nor inflamed. In this kind the bottom of the mouth is little altered in colour; the heat is moderate, the child swallows with facility enough; it takes the breast, or drinks what is offered it, without repugnance; it is calm and its sleep almost natural; the purging is moderate and there is little redness at the anus. The tubercles preserve their whiteness and transparency during the first days, but after a while become a little yellow, exfoliate, and finally disappear entirely towards the ninth or tenth day if the infant have a nurse; if it be deprived of the breast, the course of the disease is more protracted and may be lengthened to the fifteenth day.

342. The character of confluent aphthæ is marked by little tubercles so thick as almost to touch each other, and spread not only over the lips, gums, tongue and interior of the cheeks, but the bottom of the throat. These either fall off spontaneously, or are easily removed, but reappear in greater quantity and malignity. In this second variety the mouth of the child is hot, its lips are with difficulty closed upon the nipple, which is sometimes excoriated by the contact, deglutition is painful, the mildest drinks, when given in small quantity and with great caution, scarcely find their way into the stomach, the purging of green matter is constant, the fundament very red, the child is very feeble and disposed to stupor, its form is emaciated, its eyes hollow, and its cries weak.

343. Finally aphthæ is *malignant*, when the very small thick and deep tubercles form a thick white crust like coagulated milk, covering the whole of the inner surface of the mouth from the lips to the throat. This soon becomes yellow and sloughs, leaving gangrenous ulcers of a yellowish brown hue. The symptoms which usually accompany this condition, are sleeplessness, violent and continual agitation, distension of the belly, immoderate purging of acrid greenish matters, and bright redness at the anus which sometimes degenerates into gangrenous sloughs.

344. Such is the aphthous disease, in its character, in its appearances and its varieties. Other accidental peculiarities independent of the character or period of the disease cannot be considered as establishing essential differences. It is proper to observe that this aphthæ of infants is a distinct disease, differing totally from the gangrenous and malignant aphthæ observed by Hippocrates, Ætius, Aretæus, and various of the moderns. It also differs from ulceration of the mouth.

345. It is a peculiar disease, because the eruption is not at all the result of severe inflammation, but is occasioned by an acrid matter pushed by nature towards the parts which are the seat of the disorder. The form of these aphthæ also is peculiar. They make no cavity, no solution of continuity; they discharge no puriform or ichorous matter. They are a kind of phlyctenæ more or less large, and more or less extended. Their mode of termination also shows that they differ from ulcers, for they leave no scars behind them, disappearing rapidly and leaving no trace by which the attack may subsequently be known. M. Van de Wimperse, has shown that they are improperly confounded with 'nômes,' a species of ulcers that affect the mouth of scorbutic patients.

346. What is the cause of the aphthæ of infants? This question, like others which relate to essential causes is involved in darkness. M. Sanponts has attributed the production of the disease to a peculiar acidity of the milk contained in the infantile stomach; an acidity which being derived from acids and other corrupting agents, introduces a degree of acrimony into the blood and exerts its principal effects upon the stomach and intestines. This, the prime cause, being aided by damp, unwholesome air, creates according to him the aphthous disease; but bad air alone cannot produce it. As to the rest, this observer thinks there is a close analogy between the cause of aphthæ and that of the achorous disease; the difference in manifestation being occasioned by circumstances. But he thinks, and every thing sustains the opinion, that aphthæ is not dependent upon a mere acid and impure condition of matters in the stomach, but that, in this disorder the blood is vitiated by the presence of a peculiar agent, and he draws from the acid degeneration of the mucose part of the milk and the putrid degeneration of the lymphatic or cheesy part, the causes or the symptoms we have described, the etiology of aphthæ.

347. M. Auvity regarded the insufficiency and bad quality of the aliment of infants, and defect of necessary care on the part of nurses, as the efficient cause of this disease. He supposes that insufficiency of milk is the general and primary cause of aphthæ; that the most common concurrent cause, which tends to aggravate it, is the bad quality of the aliment, and that the peculiar causes operating in hospitals are the bad air arising from the assemblage of children, and the neglect under which they too often suffer in these asylums. From such etiology this author derives all the characteristic phenomena of the disease under consideration. He sees in the milk, changed into sour chyle in the stomach through imperfect digestion, the cause of the disorders in the primæ viæ, and in this same milk, still farther depraved, the cause of the acrimony, alkaliescence, or putrid principle which mingles with the blood and imparts to the eruption its bad quality; so that according to the degree of vitiation of the milk will be the progress and severity of the disease, upon which, nevertheless, the constitutional condition of the child will exert its influence either for good or evil.

348. Those who have studied the nature of aphthæ have defined it differently. Ravlin, has called it acute scurvy, but M. Sanponts has entirely refuted this opinion by showing that the complication of scurvy with aphthæ does not form the prototype of the latter, which from its nature is mild, but becomes malignant through complication and the influence of circumstances. The last named gentleman proves that the aphthæ of Barcelona is the same as that of the hospital Vaugirard at Paris, with this difference that the latter is malignant. If the opinion of M. Auvity be well founded aphthæ is an inflammatory disease which runs its course very rapidly and terminates in gangrene. Experience indeed shows that inflammation is much more apt to result in this way with infants than with adults. But M. Auvity, has never seen the disease any where else than in the hospital Vaugirard, where it usually assumes a very malignant form.

349. Since aphthæ is most common among infants assembled together in considerable numbers, it appears reasonable to suppose that it is contagious. Some are of this opinion, but others after careful examination have concluded that it has but little power of communication, and that the sphere in which its contagion operates is very limited. It has been shown in the foundling hospital

at Paris, that the contagion is not permanent. Sometimes a case of the disease is not seen there for three months, and it is only during the heat of the summer that it is common, and those who manage the institution are of opinion that if proper care be taken that the clothing or utensils used by the sick be not used also by the healthy, and that children who are well be not brought into near propinquity with the sick, there is no danger of infection; for with this disease, as is sometimes the case with small-pox, a peculiar susceptibility is required in order to its attack. This susceptibility exists in feeble, unhealthy, badly fed children, and not in those that are healthy and robust. Hence the latter may live in the midst of infection without being attacked, while the former are almost inevitably seized with the disorder. There is no ground for the apprehension that a child removed from a hospital or large city, and carried to nurse in the country can diffuse the contagion.

350. The mild variety, (340, 341,) of the aphthous disease, is usually met with among children brought up in the country or in private houses. It is not dangerous, at least under ordinary circumstances. In many countries this disorder is known as the 'white disorder.'

351. The confluent kind (340, 342,) on the contrary, is rare in the country and in private dwellings. It is common in hospitals where a number of children are kept together, and usually is dangerous. In the hospital for enfans trouvés, in Paris, before they made a change in the regimen and treatment they lost seven cases out of ten. Since the change they lose only three out of ten.

352. The malignant kind is the most fatal; it is never seen except in hospitals, and under the most aggravating circumstances. Art is powerless against it, and almost all the cases are fatal.

353. To preserve children from aphthæ it is necessary to keep them from the infected atmosphere, and from that which is filled with putrid emanations. The rooms in which they are kept should be pleasantly warmed and well aired. A little gunpowder occasionally burned in the apartment will help to purify the air, as will the frequent whitewashing of the walls. Infected chambers may be rendered healthy by the aid of acid gasses, and in some rare cases by alkaline vapours. I have spoken of these elsewhere, (64.)

354. The nurse should eat partly animal and partly vegetable food, and deny herself the free use of acids and acescent matters. She should not give her breast to the child immediately after a repast, nor in the morning before eating; she should take moderate exercise, avoid the mental passions, and she should be dismissed if she becomes home-sick and melancholy.

355. As to the children themselves, it is necessary not only to lavish care upon them both with regard to food and neatness, but it is also important to give them the leaves of the violet as recommended for the crusta lactea. Some authors have proposed to use simple rice water or sweetened infusion of dog-grass, with a sixth part of wine. Others prefer some drops of the bitter tonic tincture recommended by Whytt, or some similar preparation; absorbents, such as the antacid mixture of Boerhaave, and injections made of sugar and Venice soap. These means will be far more apt to succeed, if they be joined with the advantages of pure air, good nourishment, and the cleanliness so necessary to these little ones.

356. M. Sanponts has proposed as a last prophylactic resource, inoculation with the aphthous disease, but nobody has made the experiment.

357. When the child is artificially raised, that is to say, with other nourishment than the mother's or nurse's milk, as is the case with foundlings reared in hospitals, it is necessary to redouble the cares necessary for their preservation from the aphthous disease, and to use in their behalf all the prophylactic means of which we have spoken. Especially it is important thoroughly to evacuate the meconium. This may be effected by giving them a little milk sweetened with honey, or medicated with a little manna. Then the children should be fed upon bouillie made with flour; the milk of a good cow, tempered with the milk of almonds (123) or a decoction of barley. This diet may be strengthened by the creams of bread (122) or of rice simply aromatized, (127), and care should be taken that any nourishment thus given be of the very best quality.

358. The curative treatment of the aphthous disease presents three indications.

The first is to destroy and to expel the morbid cause contained in the stomach and intestines. According to M. Sanponts, we

should not use oils, soap, nor even rhubarb for this purpose, because oils, so far from correcting the acid matters, increase it; soap adds to the rancid acrimony, and rhubarb aggravates the irritated fibres of the stomach. The indication may be very well accomplished by a powder composed of equal parts of magnesia and sugar. A half drachm to a drachm of this preparation may be given every four hours, and its operation aided by suppositories or emollient injections if the state of the anus permits it. The nurse ought to pursue a good regimen; she should avoid every thing likely to impart to her milk either an acid or alkaline impurity. She ought to drink rice water sweetened with sugar, and to take, twice a day, a drachm of sugared magnesia in powder. It is partly in this that consists the second indication; founded upon the necessity of preventing the formation of a new morbid cause. This indication is completed by renewing the air, keeping the child very neat, and if no benefit be obtained, by affording a new nurse to the child.

359. The third indication has for its object to bring about the crisis, most natural to the disease. For this purpose it is necessary to avoid the application of the white oxide of lead to the redness of the anus, and to use instead the powdered magnesia; and if the morbid matter does not determine itself to this part, we may provoke it by dry frictions. We may perfectly succeed by irritating with fig leaves the part to which we wish to attract the eruption. Some authors have recommended the application of cups to the buttocks and thighs, and even flagellation with nettles. If the eruption that has appeared upon the neck buttocks and other parts, to the great relief of the child, should go in again, the means just mentioned should by all means be employed. In addition to this we may use the infusion of violet, &c. For if the return of the eruption, be followed by the disappearance of the aphthæ, it is apt to return very soon with a force that cannot be resisted.

360. When these means are insufficient and the aphthæ becomes gangrenous, we may have recourse to camphor, muriatic acid, and bark, but too much reliance should not be placed upon these remedies.

361. If, to the means which are the basis of this curative method, be joined to such as are proper to combat the more or

less alarming phenomena met with in the bad forms of aphthæ, and those suitable for the relief of the local affection, we shall have all the remedial means which art can bring to the aid of nature.

362. The bad state of the primæ viæ sometimes requires a gentle emetic. For this purpose one or two grains of ipecacuanha or two or three drops of the syrup of glauher or antimomial wine may be given.

The restlessness of the children may require some remedies proper to induce sleep, and for this purpose the anodyne coral powder of Helvetius or the syrup of white poppies may be used.

The weakness and depression of the vital powers require some tonics; quassia, spirituous tincture of bark or myrrh sweetened with orange peel syrup, &c. answer this purpose very well.

The sinking of the aphthous pustules may demand the use of excitants, and for this end a blister between the shoulders is an excellent means.

363. As to topical applications, in ordinary cases, we may use vinegar and water, succeeded by barley water sweetened with honey and acidulated with sulphuric acid, or by a decoction of bramble (ronce) leaves, sweetened with the syrup of mulberries, &c. Borax, (subborate of soda,) has been highly recommended, rubbed up with a little honey. In the more serious cases we may employ a decoction of bark, lime water in a decoction of barley, &c.

364. Soothing drinks, such as rice water, barley water, chicken water, or weak veal soup, are of use during the progress of the malady and especially in the commencement.

365. When the crusts are perfectly fallen, it is well to administer a laxative, such as castor oil, &c.

366. Finally we must be careful in the treatment of all kinds of aphthous disease, that the child be not exposed to cold, even during convalescence.

Aphthous Disease of Adults.

367. I have now described the aphthæ of infants, (328 to 366,) that of adults, whatever it may be called, resembles the former very closely, when we examine the nature of the exanthemata which determine the character of each.

I say exanthemata, for in the aphthous fever as in the aphthous disease of children, the aphthæ characterizing the malady are not like those ordinary aphthous conditions whose name they improperly bear. These last are little ulcers which although superficial, deepen more or less, and form cavities in the part upon which they are seated. The aphthæ of which I am now treating have a character entirely different. They are veritable exanthemata which are elevated and present an elevated tumor: whether they consist in isolated points, or extended patches, or a continuous eruption upon the interior of the œsophagus. When these pustules fall off they leave no traces behind them. Therefore we must class this variety of disease among the exanthemata, and the aphthous fever, must be considered an *eruptive fever*.

368. The ancients were acquainted with this disease, but it is to the moderns that we are indebted for a correct description of it. Ketelaer, who had observed it in Zealand, has published an excellent treatise on this subject, and following his steps, and adding to his remarks the results of their own observation, Boerhaave and Van Swieten have treated upon it, at considerable length.

369. If we are to believe Boerhaave the aphthæ are formed by the extremities of the different emunctories which pour out the saliva and other fluids upon the interior of the mouth. Hence the aphthæ occupy all the parts which are covered by the similar emunctories. Thus they are found upon the lips, gums, interior of the cheeks, the tongue, palate, throat, œsophagus, stomach and small intestines. But are the extremities of the salivary emunctories sufficiently numerous to account for the multitude of aphthæ which cover all the mucous surface of the mouth? We will be more likely to discover the real seat of this eruption by considering the organization of the mucous membrane and that of the exhalent vessels. The extremities of these vessels are innumerable, and bearing in mind the theory of repercussion as well as the succession of aphthous eruptions which take place in such circumstances, we will find some confidence springing up in our minds, in that theory which supposes the lymph to possess a peculiar acrimony which causes aphthæ, and the orifices of the exhalants to be the seat of those buttons that elevate themselves above the mucous membrane. This opinion is, at least, rendered probable by the

assertion of certain authors who hold that the miliary eruption may take the place of aphthæ in certain localities where the latter disorder is uncommon, it being known that the aphthous fever is far more prevalent in localities where the miliary eruption is rarely met with.

370. Indeed the exanthematous aphthæ are far more frequently observed among the northern people who dwell in marshy countries. It is very rarely met with in hot climates; nevertheless it cannot be denied that it is observed in temperate localities. M. le Pecq-de-la-Cloture, a physician of Rouen, has remarked upon this disease, in his work upon epidemics, in which he has carefully described an epidemic aphthæ, and Lorry has treated of aphthæ such as we now have. It is generally in autumn, when the temperature is humid and warm, that exanthematous aphthæ prevails. Subjects of all ages are exposed to it alike, but it appears to prefer infants and old people.

371. The eruption of aphthæ is ordinarily preceded by fever, and accompanied with diarrhœa, or dysentery, especially if the evacuations have been suspended by the use of astringents, or if the removal of putrid fæces from the bowels by purgatives has been neglected. In the commencement, the patients suffer with constant nausea or vomiting, great anxiety, and distress about the præcordia, debility, somnolence or stupor, and finally a sense of weight upon the stomach, of which the patient always complains. These symptoms keep up and even increase with the tumult and intensity which ordinarily accompany critical movements. Finally the aphthous eruption appears, and the symptoms of the disease are in proportion to the time when the eruption is accomplished, and the nature of the exanthematous aphthæ.

372. If aphthæ appear only in the mouth, no secondary consequences, of importance, result, but if they present themselves in the œsophagus and primæ viæ, serious symptoms may arise, such as very severe nausea, hiccough, great weight at the stomach, &c.

373. Although exanthematous aphthæ participates of the character of critical eruptions or metastases, it ought like small-pox, to follow a certain order of progress. The aphthous eruption may occur at any period of the fever, but it has been observed that cases in which it appears before the seventh day, are far more severe than those in which it is not seen until after this.

374. Sometimes the quantity of matter is so considerable that nature being unable to relieve herself by one eruption, throws off several in succession. Ketelaer and Van Swieten each saw cases in which six or seven successive eruptions took place. These new eruptions are announced by an anxiety more or less great, and especially by somnolence or stupor. They are also announced by the redness and dryness of the parts after the preceding aphthæ have fallen off. The period of this desquamation differs in a very remarkable manner, in different cases; sometimes it happens in twelve hours, sometimes in several days.

375. When the aphthæ occur here and there, by isolated tubercles, either on the tongue or the borders of the lips, or the throat, or any where else, and without any preference for the seat where they were situated at a previous eruption, the indication is favourable, especially when they are of a pearly transparency, are soon detached, and leave the parts moist. Those which present an ashy, yellow, livid or black appearance, are to be dreaded, especially the black. They are of a bad character, and generally fatal when we observe them at the bottom of the throat, presenting the appearance of a white thick and shining crust, something like fresh lard, which seems to mount slowly in the œsophagus and adheres firmly to the parts it covers. Finally the patient rarely escapes death when the whole cavity of the mouth is covered with a hard, thick and very tenacious crust.

When the eruption spends its force principally upon the œsophagus and the intestinal tube, as we cannot judge of its nature by the eye, we must draw our inferences from the severity of attending symptoms. Unfavourable indications may also be drawn from accompanying symptoms in cases of great debility, as in aged persons, where the eruption is incomplete. Ketelaer has noticed that abundant sweats and copious urine rendered aphthæ slighter and less dangerous, while a deficiency of these evacuations produced opposite effects.

376. The aphthæ having endured some days, they are observed to detach themselves by their base and fall by scales so that little by little they entirely disappear. The patients spit out the flakes of those that come off in the mouth, and evacuate by stool such as fall in the intestinal canal, which are sometimes so abundant, that Ketelaer says he has seen them amount to several basins full.

377. When the eruptions are successive, of short duration, and continue to be of good quality, it is an evidence that the morbid matter is abundant; but that nature is strong enough to relieve herself of it. It is well when the new eruptions are less thick than the preceding; when they diminish at each appearance, and when the interval between them is not long. If the aphthæ are slow in detaching themselves, we must conclude that the matter is more tenacious, the forces less active, and the vessels not sufficiently open and permeable, especially when the aphthæ return as thick or thicker than before. In such cases there is reason to doubt whether nature will be victorious.

When there is a long interval between the first aphthæ and the new, we perceive that the morbid matter is only partially elaborated; that the rest has need of maturation in order to be brought to the surface; and we may predict that the disease will be protracted and subject to many relapses; consequently that the event is doubtful.

378. We must not mistake the suffering which ensues upon the fall of the scales, for aggravation of the disease, since this is occasioned merely by the sensibility of the parts, thus deprived of their covering. It is not rare under such circumstances to find bloody stools, sharp colic, hiccough, and hypercatharsis upon the administration of slight laxatives.

379. It is in this class of symptoms that we must also include the abundant flow of saliva, and the diarrhœa which sometimes occur upon the separation of the aphthæ, and which happen from the unloading of the emunctories in which the fluids have been so long retained.

380. The treatment of aphthæ consists in two essential things. The first is to favour the eruption: the second to facilitate desquamation.

381. The eruption, being a crisis which may be considered advantageous, we must neglect nothing to make it complete: and it is here that it is most necessary to be careful in distinguishing this disease from the ordinary aphthæ; the only form which the ancients seem to have understood, and which they treated with astringents externally applied. The danger of a treatment so pernicious did not escape Ketelaer, who declared that as often as any relief to the throat and mouth was obtained in this way, an additional distress in the præcordia was occasioned.

382. We may favour the eruption of the aphthæ by cooling remedies, sometimes by tonics, sometimes even by stimulants, the choice of these remedies depends upon the state of the strength.

383. An emetic administered in the early stages, may do much good, by evacuating the primæ viæ, and by its effect upon the skin. But it must not be given empirically.

384. We must not push refrigerant remedies too far, lest we impede an eruption upon which cure depends; we may nevertheless employ with less caution, emollient injections, and baths for the feet and hands, which tend to cool the patient and soothe his suffering.

285. Among the means which gently determine to the surface are tisans made with scorzonera, violet leaves, &c. Boerhaave and Van Swieten recommended the decoction of parsnips. These and similar infusions may occasionally be strengthened by the addition of a little wine, or antimonial wine, or spirits of Minde-
rerus.

386. When it is necessary to sustain or even to excite the strength we have recourse to wine and tonic infusions of vegetable bitters.

387. When the eruption of the aphthæ is complete, the time has come to assist in the separation of the crusts. This is effected by abundance of mild warm drinks, humid vapours, injections, cataplasms to the neck and belly, by using sweet and detergent substances, such as honey, the juice of turnips, &c. The decoction of turnips, or their expressed juice slightly cooked and sweetened with honey, is a remedy which usage has particularly consecrated to the treatment of aphthæ

388. As soon as the crusts are fallen we have new indications to fulfil such as to soften the sensitive parts. This may be done by the use of broths of veal, or chicken, creams, mucilages, &c.

389. At this period we must pay much attention to the signs which indicate whether a new eruption may be expected. If another appear probable we recur to the remedies proper to facilitate the eruption. In this case we may be more liberal in the use of tonics in order to support the strength; but stimulants are dangerous, as very likely to provoke eruption and render it confluent.

390. In the second case, where the sensibility of the parts is very much abated, we may have recourse to slightly tonic deter-

gents. For this purpose a decoction of the leaves of liverwort with honey has been recommended, but before employing this we must be satisfied that depuration of the humours has been accomplished. This is ascertained by the cessation of fever, the urinary deposite and the openness of the pulse.

391. The cure may be completed by a mild laxative. If this be employed too soon, risk may be incurred of hypercatharsis, and pain—but when given at the close of the disorder it is useful by cleansing the intestinal canal of the aphthous scales which abound there. To effect this purpose, we should select a mild purgative which possesses some tonic or astringent quality; such as rhubarb.

392. As aphthæ may appear in combination with other maladies, it will sometimes be necessary to modify our treatment to suit such cases. Sydenham has recorded a case of this kind. He saw aphthæ complicated with intermittent fever, and cured it by bark. During the administration of this powerful tonic the aphthous crusts separated themselves with greater facility than usually happened in cases of mild character and vigorous constitution when bark was not used.

393. The regimen to be observed during the aphthous fever should, in the first place be farinaceous, then cordial, then soothing, and finally analeptic. The creams of bread, or rice, meats roasted and seasoned with wine, veal soup, vegetable jellies, and good broths may successively be employed.

Aphthous Disease of Dentition.

394. The aphthæ of dentition are of two and even of three sorts. The first does not differ from the aphthous disease of infants, (328, 366.) The second is identical with that of adults, (367, 393;) the third consists of ulcers of greater or less extent, either simple or scorbutic, and differs essentially from true aphthæ.

395. According to my observation, infants are most liable to aphthæ, when they have an acrimony in their fluids: when they heat themselves in their efforts to get milk from nurses who have but little; when they have not been kept clean; and when they have been wrapped up too warmly in their cradles. Dentition adds greatly to these causes, especially to the first two. The pain of the gums and heat of the mouth puts in motion the simple or specific acrimonies, and disposes the children to that particular

eruption which appears upon the membrane of the mouth, and may either stop there or extend to the anus.*

396. But those little white or yellowish buttons that accumulate upon the gums, the interior of the cheeks, the tongue, lips, velum palati; or those white patches, very slightly prominent, which our nurses describe under the name of 'white evil,' which sometimes go no farther than the mouth, and sometimes extend to the anus, have nothing in common with the superficial or the profound ulcerations which leave inflammation of the gums after them. Aphthæ are not ulcers. They do not sink below the surrounding surface but rise above it; they pour out no purulent matter, and fall off by desquamation, to be renewed if the system be greatly vitiated.

397. Although aphthæ presents a particular character in nursing infants, and when compared with the aphthæ of adults seems to be almost totally different, yet in observing each with scrupulous attention, we find them to be merely varieties of the same disorder, not distinct diseases.

Children at birth have much mucosity, and their bodies are, so to speak, impregnated with lactescent matters. Children more advanced, yet nursing, abound more in albuminous juices. Adults have a greater quantity of fibrine, and it may be that such are causes which create those modifications of aphthæ which we have noticed.

398. Aphthæ may be sporadic or epidemic. It prevails epidemically in the hospitals, where a great number of infants are assembled: I have no knowledge that it is epidemic under any other circumstances. When aphthæ is met with in private practice, it never occurs, so far as I know, in children over four months of age, and in most cases it can be traced to the irritation of dentition.

399. Nurses are well acquainted with this affection. They recognize it as physicians do, by the round white spots, isolated or confluent, and they estimate the danger by their quantity, coherence, odour, by the degeneration of colour through the changes of yellow, grey, brown or black, and by the constitutional symp-

* It is hardly necessary for me to disavow the many pathological opinions of M. Baumes, which differ from the received opinions of the present day. I have undertaken to translate his work, not to refute his doctrines.—*Trans.*

toms attending the eruption. They are in the habit of treating aphthæ empirically, by local applications, such as vinegar, with which they wash the mouth several times a day; sometimes so rudely as to bring blood, which they think important. I have seen many cases cured by vinegar, and this acid acts more powerfully than the most vaunted topical applications. Nurses generally purge the children.

400. The rational method of treatment does not conflict with the results of experience. Success with vinegar can only be obtained when the eruption is complete, and when the apthous acrimony is not complicated with any other. I have seen apthæ of a truly scorbutic character, and in these cases the best topical applications did no good until proper constitutional means were used to invigorate the system. For the children of the poorer class I have recommended a decoction of the rasped wood of guaiacum and burdock, in which orange peel was thrown, and for the children of the rich the infusion of cassia, cascarilla and sassafras. When more active applications were necessary I added to these preparations a little tincture of myrrh. Often nothing more is required than the internal use of a watery infusion of rhubarb, and the topical use of vinegar to cure an apthæ of great apparent violence.

401. As the apthæ of dentition are but symptomatic, however unfavourable they may appear otherwise, they must share the lot of the malady to which they are subordinate. We need not form an unfavourable prognosis when the white apthæ are seated upon well coloured flesh; when the salivation is easy, the restlessness readily overcome, the thirst easily assuaged, the diarrhœa without tormina and not excessive. But when the apthous spots are very much flattened, and appear as large patches of a very dead white colour, and when besides this there is great thirst, hoarse voice, weeping eyes, swollen lips, engorged salivary glands; if the carunculæ lacrymales are dry, if the vomiting, the colics, the purging and tenesmas, announce a general affection of the mucous membrane of the interior; if a dry cough and painful respiration announce that the trachea and bronchia are affected; if fever with its train of symptoms gives evidence of general disorder, the apthous disease must be considered as only an item, unpleasant enough, among the symptoms of painful and complicated dentition.

402. An infant, seven months old, having no teeth, but its gums in such a state as indicated that the first incisors were about to appear in both jaws, had some days of uneasiness and violent colic. Its mouth became suddenly hot, and two or three days afterwards there was an eruption of aphthæ. I directed for it an emetic of ipecacuanha, a mouth wash of flax-seed decoction, acidulated with vinegar, and both the nurse and child were made to drink rice water, slightly seasoned with cinnamon. The aphthæ remained distinct and white; they did not increase but they did not seem inclined to disappear. I repeated the emetic, because the first had been useful, and the second was not less so. The bowels were free, nevertheless I gave some rhubarb, with the addition of a little white wine. The eruption appeared to become whiter, but it remained until the appearance of the four incisors. The aphthæ in this case evidently belonged to dentition, but I know of no other means than these I employed to prevent their increase or complication.

403. A child, eleven months old, having four incisors, two in each jaw, had an aphthous eruption which hindered deglutition and nursing, and which were supposed to proceed from dentition. I noticed the following symptoms. Ophthalmia with a discharge partly viscous, partly serous and puriform; great emaciation—redness at the end of the penis, with fetid discharge from the gland and prepuce; transudation with excoriation in the folds of the groin, and in a fold of the skin on the right thigh; a scabby sore with some fissures from which a little moisture exuded near the left commissure of the lips; some scaly buttons on the right buttock and arm, and left shoulder; finally aphthæ, which formed ulcers with unequal borders, turned up, and callous, situated, one below the tongue, one on the gum not far from the incisor tooth of the inferior jaw, and four or five others, quite small, located on the inside of the cheeks. These symptoms satisfied me at once that the disorder was syphilitic and the pretended aphthæ, veritable chancres. The nurse, complained only of some sores on the nipple, but being pressed confessed a suspicious discharge. The nurse and child recovered under the proper treatment, (167, 170,) but in spite of all efforts the infant had a very slow dentition.

404. A child, eight months old, having pierced one incisor tooth, suffered much from the next tooth which did not make its appear-

ance. It had serous green diarrhœa, colic, cough, and fever; and there was cause to apprehend convulsions. Wishing to know what was the state of the dentition, I made it open its mouth, and I found it covered with aphthæ, distinct and of ordinary colour. The nurse had never perceived it. She had a lively constitution, and I ordered her to bathe herself and to regulate her diet, which was all I could induce her to do. It is rare that women, especially of the lower class, can be made to believe that remedies administered to them may be useful to their children. The infant was bathed also. The nurse notwithstanding my advice, obstinately washed the child's mouth with vinegar, and she was convinced that this acid had contributed very much to the cure of the aphthous disease. In the meantime I opposed to the disorder, besides this topical application, some gentle laxatives, and an anodyne every evening, and a mixture composed of three ounces of linden water, two ounces of orange flower water, an ounce of the syrup of mallows and six grains of carb. potassæ. All the symptoms disappeared, little by little, though slowly. The fever first disappeared, the colic and the cough then abated; the aphthæ disappeared, and the purging which resisted longest, nevertheless changed its character and became more regular.

405. An infant, of fifteen months, furnished with its eight incisors and the first molar of the inferior jaw, feeble, of yellow skin, and very fetid breath, discovered upon examination its gums engorged, softened, bleeding, and teeth black and loose. It was purging quite frequently, and its countenance discovered all the marks of emaciation, mingled with suffering. This scorbutic condition had not hindered dentition, but had accelerated its development. I used a decoction of bark strengthened with half an ounce of antiscorbutic wine to two ounces of the decoction, and this remedy employed within and without, ameliorated the disease considerably. Soon the wine appeared to stimulate too much and I substituted the antiscorbutic syrup. The child was purged at intervals. The diet of the nurse was attended to, and the child got well without further treatment.

406. Of these four cases, two, the first and the third, offer instances of aphthous disease treated with simple means, the others, two cases of disease independent of aphthæ and of dentition, but upon which the dental development exerted some influ-

ence. I thought proper to relate these latter in order to warn young practitioners against appearances entirely foreign to dentition, but very liable to be attributed to it, because developed at the time of the pushing forward of the teeth. These cases and others that I could mention, prove that sporadic aphthæ are rarely very dangerous. When they merit very serious attention, experience has demonstrated the advantage of mild emetics, since they cleanse and strengthen when their operation is not too harsh, and restore the transpiration. A good diet, alternately animal and vegetable, and seasoned with wine, medicated drinks, exercise both for the nurse and child, topical applications for the mouth, according to the sensibility of that cavity—such as diluted acids, antiseptic decoctions, acidulated, aluminous, or alkaline, according to circumstances, these are the proper remedies. The muriatic acid and sulphated alcohol have been vaunted. Paul d'Egine, employed as an application to aphthæ of a black colour, iris mingled with oil.

407 Purgatives should form a part of the regular treatment of aphthæ, especially when they moderate the diarrhœa or render it more regular, because these remedies prevent complications. They ought not to be suspended except when the space intermediate between the aphthæ grows pale, or when there is diarrhœa. Then injections suffice or a prudent use of the red hydro sulphuretted oxide of antimony. When there is reason to believe that the apthous eruption is propagated to the œsophagus, because deglutition is painful, we should use besides the milk of the nurse, mucilaginous drinks, such as gum water, flax-seed tea, barley water, &c.

408. Sedatives and narcotics are not to be neglected in the treatment of aphthæ. They allay the pain and moderate the cough. Hence physicians are in the habit of using saffron syrup, extract of wild poppy, syrup of poppies, and other opiate preparations. Emollient and warm vapours, which the children may be made to inspire, calm them very much.

409. Great attention must be paid to neatness. The nurses must wash their breasts very carefully. M. Kaemph has recommended them to use a protection for the nipple made of chalk, soaked for some minutes every day in rectified spirits of wine, in which some mastic is dissolved. Nothing will more effectually

guard the breasts against the clefts which without great precaution will form upon them.

12. *Of pain, and some symptoms ensuing from the resistance of the gums, or obstacles presented by adjoining teeth.*

410. No symptom can be combatted advantageously except by attending to the cause which creates it. The best selected remedies have been applied in vain by the most sagacious physicians, to the relief of various disorders of dentition. In many cases it is necessary that the teeth, whose difficult eruption causes so much suffering, shall escape before relief is given, and the infant is saved from the consequences which threaten it. Thus in the unnatural condition of the alveoli and the gums (209, 212,) or in that arrangement of the teeth, in which they are thrown upon the alveoli whence new teeth should emerge, we must seek the direct obstacles to dentition in order to remove them.

411. Indeed if the progress of the teeth be very slow, on account of the obstacles opposed to them being greater than nature can surmount, the suffering and the action of remedies applied for the relief of it, after a while wear out the strength of the child; hence we should not persevere in the use of such remedies beyond a certain point, and never after the teeth have so far progressed as to render mechanical aid available. Incision of the gum, or extraction of one of the teeth nearest to that struggling for liberation, are the means which naturally suggest themselves in such cases.

412. As there is difference of opinion with regard to the propriety of incising the gums, it is necessary that I should devote some time to the consideration of this matter. Some think the operation dangerous and useless, while others regard it as the most effectual means of relieving the unpleasant symptoms of dentition.

413. M. le Camus, a physician of the faculty of Paris, is a prominent opponent of the practice in question, owing to his peculiar views with reference to the evils of dentition and their cause. He denies that difficult teething is a cause of convulsions, and hence asserts that incising the gum can be of no use in preventing them. Van Swieten held similar opinions and argued against the operation.

414. Every one will agree with these authors that all cases of convulsions, even occurring in dentition, are not caused by the pain of teething. They are often the result of irritating matters in the *primæ viæ* which must be voided before relief can be obtained. Emetics and purgatives are the effective remedies in such cases. But where these symptoms, occurring during dentition resist all these means, and when other symptoms of difficult dentition are present: when the teeth, elevated above their alveoli, evidently press upon the gums, which are tense, shining, painful, &c. we should infer that the convulsions are the result of nervous irritation, excited by the teething, just as certainly as in other cases we attribute them to irritation in the bowels or any other organ distant from the immediate seat of morbid manifestation. Do we not often see cases wherein a periosteum irritated by spiculæ of fractured bone, causes convulsive movements in the muscles of the jaws? Why then may not the teeth whose eruption is difficult, cause inflammation of the gums which surround and compress them? Why may they not create all the primary and secondary symptoms of great irritation? For my own part I am convinced by my own experience and that of many others, that difficult and laborious dentition may produce convulsions, and other symptoms no less serious, as may local irritation in any other part of the body. We have mentioned a case (210,) where an infant continued to suffer with convulsions, although the *primæ viæ* were well evacuated, which certainly were caused by the pain of dentition. The observation of Tulpins, whom M. Camus quotes in favour of his theory, is by no means conclusive. He relates that a physician of Amsterdam, tormented by his wisdom teeth which could not make their way through the gums, incised the gums with a scalpel, and that so far from relieving the pain and extricating the teeth, he made matters worse. The incision caused fever, wakefulness and so violent a delirium that the patient became furiously mad and died in great agony.

415. What can this case be thought to prove? Was the gum properly divided? If the gum was only partially incised; if some fibres whose tension caused the suffering were not divided, the operation might well have increased the suffering. We know that if a distended part be wounded and not completely severed, it will swell and thus additional pain must result, and in the case before as, if the distended gum was only partially divided, it

doubtless healed in a short time and continued to obstruct the passage of the tooth. That an operation has been awkwardly performed is no argument against its employment by skilful men, and so far from regarding the incision of the gum as useless we regard it as often necessary, and altogether preferable to persisting in remedies which have in any case failed after fair trial. I will point out presently some precepts for the guidance of young practitioners in such cases.

416. A case recorded in the 28th volume of the old Journal of Medicine, confirms triumphantly, the doctrine I have advanced. A child, sixteen months old, had been sick for three days. Fever, ptyalism, and swelling of the face, indicated that dentition was progressing. Relaxing topical application, seconded by mild and soothing drinks, and by the use of injections by which the bowels were kept free, were made use of; nevertheless, the fever and local inflammation augmented from day to day. The tension of the gums threatened convulsions. This condition demanded prompt and efficient aid. A physician was called who made a crucial incision upon the gums, which, by their swollen appearance and intense redness, gave notice of the place upon which the teeth were pressing. To operate with more ease he introduced into the child's mouth, upon each side, a piece of cork, which held it open. Six hours after the operation, the symptoms continued as violent as ever, and the life of the child was in jeopardy. The physician then dissected the superincumbent gum completely from the teeth, and this operation was completely successful.

417. In Petermann's cases, printed at Leipsic, in 1707, we read that a child a year old, in which convulsions ensued upon dentition was dosed by a physician with the cinabar of antimony. The child died, and upon examination the abdomen was found to be full of coagulated blood, and other effects were noticed which I need not relate. Certainly this practice was more objectionable than incising the tumefied gum.

418. Lieutaud recommends section of the gums in very urgent cases, and when the tooth is ready to come through: but it is not at the commencement of the symptoms of difficult dentition that we should have recourse to this means. Incision should not be practised until other means have failed. It is an extreme remedy and should only be used where there is no expectation that relief

will otherwise be obtained.* Ambrose Paré recommended this operation and practised it upon his own children. This celebrated author regretted that the gums were not cut for the relief of the son of the duke of Nevers, who died when eight months old. According to the testimony of the physicians who examined the body, this infant died of the consequences of dentition. No tooth had appeared and the gums were found to be hard and swollen. When they were cut the teeth were ready to escape, and doubtless would have done so, had nature been properly aided by art.

419. Guillemeau gives particular directions for the performance of the operation in question, upon the several kinds of teeth. Henniger, also advises incision when the teeth are ready to escape, saying that it suddenly relieves the pain and facilitates dentition.

420. M. Brouzet, who has treated ex professo of the medicinal education of infants; M. Desessarts, who has published a work on the same subject; M. Delearie, who has also treated of the diseases of children; all advise incision when other means have failed, but none indicate the precise point when the operation may be successfully performed. I have noticed that it is not a matter of indifference, at what time the incision is made. It may be dangerous, when the gums are much swollen and the inflammation great; for besides the pain which in such cases is more intense, the vessels are more full of blood, and though the hemorrhage is usually trifling, it might be unpleasantly abundant. The child might be distressed by the quantity of blood that it might swallow. Besides this, incision made during great inflammation, might occasion other serious consequences, as an increase of pain, and other symptoms remarked in the example drawn from Tulpus, (414.)

421. In such cases, before performing the incision, we should have recourse to the general remedies proper to diminish the intensity of the symptoms. It is not until these have been allayed that incision can be practised with advantage. If, however, notwithstanding the employment of these remedies, the symptoms continue with unabated force, we must have recourse to incision,

* It is amusing to read these grave remarks upon an operation which is now performed daily by physicians and old women with the utmost impunity and frequent success.—*Trans.*

although the teeth be not greatly elevated above the alveoli. In such cases as I have already observed, the gums are not the only obstacles which oppose the efforts of the teeth to escape. The too crowded borders of the alveoli, or the narrowness of the passage left between adjoining teeth, (such as is observed sometimes, when the canine teeth are endeavouring to push forward between the posterior incisors and the first molares; when these are very large or misplaced,) also offer difficulties, which being insurmountable, perpetuate the pain, increase the other symptoms to a frightful extent, and call for operations far more serious than mere incision of the gums.

422. These two cases are, doubtless, difficult to be distinguished, nevertheless, by attention they may be discerned. When the gums, by their density oppose the eruption, the teeth nevertheless, elevate themselves above the alveoli, and push the gums towards the interior of the mouth; because though they resist the progress of the teeth through them, they nevertheless yield to the pressure. This appearance, which is readily noticed, does not take place where the obstacle consists in narrowness of the opening of the alveolus. The resistance which this opposes prevents the tooth from elongating itself towards the gum and pressing upon it. The effort of the tooth reacts upon the bottom of the cavity; the periosteum is compressed and bruised; the nervous filaments distributed to each tooth are irritated; the pain becomes intense, and very serious consequences may result. Under these circumstances the gums present an equal surface, not being elevated, or thinned by the pressure of the teeth. The absence of the signs which indicate the first condition, will also aid in distinguishing this. Similar symptoms occur when the tooth which seeks egress is, imprisoned between two others.

423. The cases under consideration (421, 422;) are, happily, very rare; but it is on this account that I dwell particularly upon them, in order to warn young practitioners, and especially such as practise in the country, of the necessity of being able to distinguish them.

424. The alveolar orifice does not often form, by its narrow border a circular wall which opposes the progress of the tooth. Generally it is but a part of the alveolus that makes the difficulty, while the rest offers no impediment. In this case the tooth may

at last force its way out but it cannot observe its proper parallelism. It escapes by the side where it finds least resistance, and continuing to advance in this direction makes the denture irregular and disagreeable. This effect may be produced independently of the plurality of germs, which, whatever may be thought of it, does sometimes occasion a similar vice of conformation.

425. If the obstacle to the egress of the teeth depends merely upon the resistance of the gums their section is indicated, but it is first necessary to ascertain by the touch that the gums are hard, and also that a white spot be observed at the point of contact with the tooth. When these indications are observed, incision may be practised with great success; particularly in cases such as I am about to relate; which I will do in the words of the observer who communicated them to me.

426. A child, an only son, aged three years, of delicate temperament and feeble constitution, which had already experienced, at the appearance of its first teeth, different accidents, which nature had surmounted, was afflicted with them, when some molars began to make their appearance. This child had considerable fever with very strong convulsions. All the general remedies had been employed to calm these symptoms, but none had been successful. When I first saw the child it had been already sick for several days. I found it in the arms of its nurse, its head drawn down upon its shoulder by the contraction of the muscles of the head and neck. I wished to relieve these parts, but at the least touch, the cries of the little patient prevented a continuance of any effort of this kind. In my presence it had several convulsions, and although they did not continue long, the muscular contraction of the neck was permanent. As I was well acquainted with the history of this child, and was aware of the difficulties of the previous dentition, I was led to suppose that the present symptoms might have a similar cause. On examination, I found the teeth, which were ready to appear, pressing upon the gums and causing them to project considerably. The salient points which immediately covered the enamel of the teeth, were white, and the rest of the gums were red and inflamed. I assured the parents, who feared the loss of this child, as they had already lost two others in dentition, that the symptoms would yield to section of the gums. They consented to the operation, which I

performed by making a crucial incision upon these parts that covered the teeth, with a small narrow semi-curved bistoury.* I dissected the gum thoroughly from the teeth and cut off the angles of the incision with a pair of scissors, which I found in the house. By this means I afforded a free egress to the teeth. The wounds bled a little, but the hemorrhage was readily arrested by the application of a pencil of charpie, moistened in oxycrat. After this nothing was used but a little honey applied in the same way. This operation calmed the infant; the convulsions ceased from that day, and the head returned to its proper position. The fever immediately abated and in two days entirely disappeared. The child was purged twice, the teeth rapidly appeared, and there was no return of the difficulties which had required the operation.

427. This case proves that the convulsions depended solely upon the resistance offered to the egress of the teeth by the dense and solid gums, and demonstrates the necessity of dividing the parts for the relief of such affections when they occur under similar circumstances. This case also refutes the assertion of M. le Camus, quoted above. (413.)

428. All the remedies that can be employed, says M. Brouzet, to relieve the accidents of dentition will not always enable us to dispense with some operations. The choice of instruments and the manner of operating are worthy of consideration. Simple incision of the gums may sometimes suffice. Mauriceau reports that a small incision which he made on these parts, gave egress to two large teeth, the pressure of which upon the gums had caused fever and convulsions, but many facts are recorded to show that a simple incision is not always sufficient to remove the difficulty. Frequently, if the operation be not carried further than this, the unpleasant symptoms will recur from the swelling and inflammation of the wounded parts. All observers agree upon this point, and I have already quoted a fact (416) from the Journal of Medicine which fully confirms this opinion. I could cite many more in evidence of this point, but I will content myself with quoting the following from John Hunter.

* When a bistoury is employed the cutting edge should be covered with linen except so much of it as is to be used in making the incision. This will prevent the possibility of wounding other parts than those proper to be divided.

429. An infant was attacked with contraction of the flexor muscles of the hands and feet ; so strong that the toes and fingers were kept bent, and so distorted as to appear to be out of joint. Every antispasmodic remedy had been perseveringly tried for many months without the least benefit. Hunter incised the gums, and in a half hour the contractions disappeared ; but as the incisions were not very extensive and the flaps not removed, the gums cicatrized. As the teeth continued to increase they soon exceeded the space afforded by the operation, and the spasmodic contractions reappeared, which led Hunter to repeat the operation ; which relieved them as before. This return would not have occurred if the flaps had been freely dissected away at first. This remark appears to me important, in order to warn young practitioners of the necessity of fully liberating the teeth, if they would prevent the recurrence of unpleasant symptoms.

430. The choice of instruments for the performance of this operation is not so unimportant as many think. M. Brouzet, whom I have already quoted, thinks that a mere scratch with the nail of the nurse's or doctor's finger will answer all necessary ends ; he holds that the opening of the gums may be either longitudinal or transverse, provided that no wound be inflicted upon the gum adjacent to the maxillary bone, or the periosteum. From such assertions we may safely presume that M. Brouzet has seldom seen infants in difficult dentition.

431. Indeed experience demonstrates, as cases we have quoted and many analogous ones show, that the manner of incision is not so unimportant as this gentleman thinks, and nobody can doubt that a cutting instrument accurately directed, is preferable to the finger nail of a rough and awkward nurse. Some better advice than this ought to be expected from a physician who is consulted in such a case. A simple scratch, which tears and bruises the gum, will not suffice to calm the symptoms and accomplish the ends required by art. Such a proceeding would be more likely to cause unpleasant consequences than to relieve them. Methodical incisions only can accomplish the ends required. We have already seen by the cases reported in paragraphs 416, and 429, that incisions made by sharp instruments, though very different from mere scratches, were not sufficient to prevent the return of symptoms, because they had not been carried to the necessary extent.

It is necessary that the incision be freely made. I prefer the

crucial form because of the facility it affords for dissecting away the flaps of the gums, a precaution which I think is always necessary to prevent the reunion of the wound and the recurrence of the unpleasant symptoms. This form of incision may be used in the case of any tooth, whatever Guillemeau and M. Brouzet may think to the contrary, provided proper pains be taken.

432. M. M. Desessarts and Delearie, properly condemned the section of the gum by the nail of the nurse. This operation may increase the inflammation which, in most cases, is abundantly sufficient; besides experience shows that in general the unequal division or tearing of soft parts, even of such as are not inflamed, may be fraught with serious consequences; what then might not happen from such a wound as the tearing of the gum with the nail?

433. M. Henninger, whom I have already quoted, recommends to make the incision with a lancet. This instrument is difficult to manage where the teeth are situated in the posterior of the mouth. The bistoury is more convenient, but it should not have a cutting edge along its entire length nor should its blade be as wide as for ordinary cases.

434. The child should be held firmly, and its head well fixed. The fingers must be introduced to separate the lower jaw and the tongue, and to distend the mouth so as to afford space for the operation; then a crucial incision must be made upon the enamel of the tooth, and the flaps dissected up, pushing them a little towards the outer side of the tooth as if we wished to bare it completely. Then the lifted edges of the gum must be cut off with long narrow bladed scissors, or any others that may be suitable. The operation is to be repeated upon each tooth that may require it.*

435. Blood will flow from such incisions, but this is of little consequence. A moderate hemorrhage will relieve the inflammation of the parts, and prevent unpleasant consequences. To hinder the child from swallowing the blood its head must be so inclined as to prevent it. The mouth may then be washed with water, and a little lint moistened with oxierat* or alum water may

* An operation of the kind above described is certainly unnecessary in the great majority of cases. A simple crucial incision carried freely down upon the teeth will generally be sufficient.—*Trans.*

* A mixture of vinegar and water.

be laid upon the wound. The little incisions soon heal; the teeth progress; all evil consequences of the dentition disappear, and the child recovers.

436. But, if in spite of attention to these rules, inflammation should ensue and pain continue, the child must be bled, and emollient fomentations (138) be used. This operation may be performed upon the gums covering any of the teeth, making the incisions more or less extensive according to circumstances.

437. If after having incised the gums it be found that the obstacles to the eruption of the teeth be rather the contraction of the alveolar orifice than density of the soft parts, we should endeavour to ascertain the existence and the degree of this contraction which may be complete or incomplete. In either case the opposing wall of the alveolus should be removed either by breaking it with fine forceps or cutting it with strong scissors. Generally the superabundant bony structure is very thin and may readily be removed. The tooth soon recovers liberty of elongation, its fetters are broken, and as it no longer presses upon the periosteum or nervous filaments, the accidents resulting from such compression soon disappear.

438. But, if notwithstanding these operations, the accidents and above all the convulsions are not relieved, we would have reason to believe that the nervous filaments were still in a state of compression. In such case it would be necessary to elevate the tooth with a proper instrument. This will be the only way of relieving the pressure and allaying the nervous distress; or it will be necessary to extract the tooth whose presence causes the disorder. This is an extreme remedy, it is true, but it is all that remains to be done where the convulsions are not relieved by other means.

439. To authorize this practice, we have only to repeat the observations which M. Baum, member of the old College of Surgery, has made in the Hospital Salpetriere. This experienced surgeon remarked that a certain number of children suffering under difficult dentition had been relieved by the means I have described, modified according to circumstances.

440. When the unpleasant symptoms depend upon the piercing of one or more canine teeth, when the small molars and posterior incisors, having previously appeared, are too close together, and are already firmly fixed, the accidents are very serious. It

is necessary to examine such cases very closely, to be assured of the actual condition, before the remedy be determined upon. It often happens that the canine tooth, being pointed at its extremity, readily pushes its edge through the gum, but its body cannot advance on account of the opposition of the adjoining teeth; in such cases the symptoms of nervous irritation continue after the eruption of the edge of the tooth.

441. To remedy this inconvenience and the symptoms resulting from it, which jeopard the life of the child, it is necessary to extract the lateral molar, as being that which from its size offers the greatest impediment to the progress of the canine. Afterwards the gum enclosing the base of the canine tooth may be incised, and then all accidents will cease and the tooth progress.

442. Levret, who recommends this practice, otherwise authorized by conclusive facts, advises the same process with regard to the molars, when the second small molars do not appear until after the opposition of the large ones of the same kind. These last jointly with the first small molars, sometimes press so closely upon the second, that the latter cannot advance. The accidents arising from this condition may readily be relieved by the extraction of the first small molar, the space thus made, permits the second small molar to advance towards the gum and pierce it without difficulty. Its progress may be accelerated by incising the gum as previously directed.

443. To modify the opinion of Levret adopted by Rosen, it is well to make a remark in reference to the difficulty which the canine teeth sometimes meet with, when the incisors and lateral molars are already cut; a condition sufficiently rare, and which M. Levret does not appear to me to have looked upon as such. The opinion of this celebrated surgeon is that the base of the canine teeth ought always to remain a little below that of the others, in order to their being firmly fixed in their place; otherwise the pyramidal shape of their roots may cause them to become loose. This idea is not very felicitous. We know that the base of the canine teeth is generally on a level with that of the others. We know, too, that the roots are very long in proportion to their bodies, and that each alveolus is exactly adapted to the shape of the fang it contains. It is therefore owing to the perfect contact of the root with every part of its socket; to the blood-vessels and nervous filaments which ramify through the alveolar periosteum

into the teeth and spongy tissue of the maxillary bones, and to the flesh of the gums which is firmly attached to the neck of the teeth, that their stability is so great, and by no means to the circumstance mentioned by Levret.

444. It sometimes happens, however, that the bases of the teeth adjoining the canine are so much enlarged at the expense of the superior part of the adjacent alveolus, that the escape of the intermediate tooth is considerably impeded, and not being able to rise to its natural height, its root presses the alveolar periosteum and the nerves and blood-vessels situated at the bottom of the cavity, and causes exceeding pain, which originates symptoms which threaten to destroy the life of the child. The knowledge of the difficulty suggests the method of relieving it. It is to extract one or two of the adjoining teeth. This will readily relieve, unless there be disease independent of dentition, and unless the operation be too long delayed. The molar should be extracted in preference to the incisor as it offers the greater impediment.

445. To be assured that the pain is occasioned by pressure upon the periosteum, &c. by a tooth hindered in its eruption by adjacent ones, the point of the tooth must have escaped without the pain having ceased, or the unpleasant symptoms abated. Besides the gum inflames and swells, and sometimes grows again over the point which has pushed through. Sometimes this alternation of appearance and disappearance is repeated more than once, the child suffering horribly.

446. But to believe with Levret, that the eruption of the canine teeth is only laborious on account of reasons stated in sec. 443, would be entirely at variance with the well known rules of dentition. It is to infer general laws from particular cases. The habit of reflection upon this matter has led me to believe that if the cutting of the canine teeth is sometimes more painful than that of others, it is because they are frequently the last, and close the first dentition: and because the accidental mobility of which I have spoken (36,) as determined by dentition, has then been accumulated to the utmost, and hence less irritation is required to produce serious consequences at that time than at others.

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